MTNC030939A1
B05

Service Manual

Color Television

Simplified

CT-3233HG
NA8ML

This simplified service manual is issued to add listed models to the simplified service manual order MTNC010524C1 (CT-32SX31E). Unique settings and parts list are included in this simplified manual. Please file and use this simplified service manualtogether with the main service manual order No. MTNC010524C1 (CT-32SX31E).

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⚠ WARNING

This service information is designed for experienced repair technicians only and is not designed for use by the general public.
It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product.
Products powered by electricity should be serviced or repaired only by experienced professional technicians. Any attempt to service or repair the product or products dealt with in this service information by anyone else could result in serious injury or death.

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IMPORTANT SAFETY NOTICE

There are special components used in this equipment which are important for safety. These parts are marked by ⚠ in the Schematic Diagrams, Circuit Board Diagrams, Exploded Views and Replacement Parts List. It is essential that these critical parts should be replaced with manufacturer's specified parts to prevent shock, fire or other hazards. Do not modify the original design without permission of manufacturer.

1. Safety precautions

1.1. General guidelines

An isolation transformer should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injuryfrom electrical shocks. It will also protect the receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always replace protective devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the receiver. Use only manufacturer’s recommended rating for fuses, circuits breakers, etc.

High potentials are present when this receiver is operating. Operation of the receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautionswhen servicing high voltage equipment.

Extreme care should be practiced when handling the picture tube. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, usesafety goggles and heavy gloves for protection. Discharge the picture tube by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a wellinsulated wire or use a grounding probe.Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to x ray radiation.

The test picture tube used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against x ray radiation as well as implosion. The magnetic shieldlimits the x ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling 40kV without causing x ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. Do not use a line isolation transformer when testing.

1.2. Leakage current cold check

Unplug the A.C. cord and connect a jumper between the two plug prongs.Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a returnpath to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

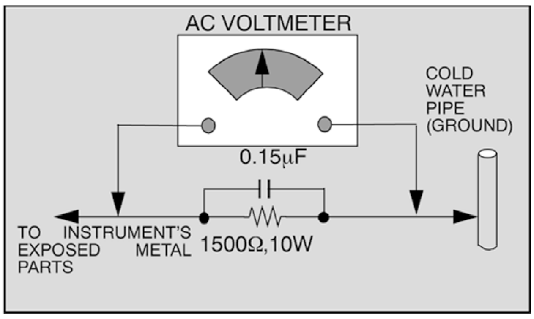
1.3. Leakage current hot check

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15 μ F capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts. Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson model 229, Sencore model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. Ifany measurement is out of the specified limits, there is a possibility of a shock hazard and the receiver must be repaired and rechecked before it is returned to the customer.



1.4. X ray radiation

WARNING

The potential source of x ray radiation in the TV set is in the high voltage section and the picture tube.

NOTE

It is important to use an accurate, calibrated high voltage meter.

Set the brightness, picture, sharpness and color controls to minimum. Measure the high voltage. The high voltage should be 30.55 ± 1.25kV. If the upper limit is out of tolerance, immediate service and correction is requiredto insure safe operation and to prevent the possibility of premature component failure.

1.5. Horizontal oscillator disable circuit test

This test must be performed as a final check before the Receiver is returned to the customer. See horizontal oscillator disable circuit procedure check in this manual.

2. About lead free solder (PbF)

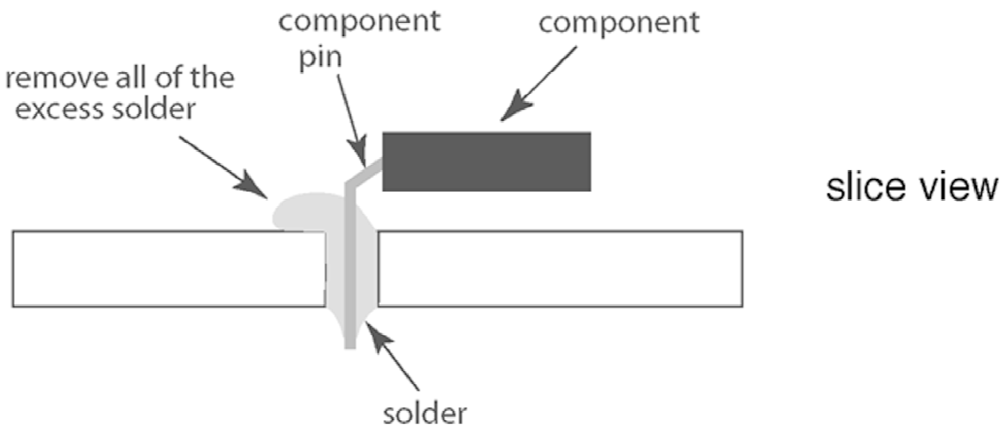
NOTE

Lead is listed as (Pb) in the periodic table of elements. / In the information below, Pb will refer to Lead solder, and PbF will refer to Lead Free Solder. / The Lead Free Solder used in our manufacturing process and discussed below is (Sn+Ag+Cu). / Thatis Tin (Sn), Silver (Ag) and Copper (Cu) although other types are available.

This model uses Pb Free solder in it’s manufacture due to environmental conservation issues. For / service and repair work, we’d suggest the use of Pb free solder as well, although Pb solder may be / used.

CAUTION

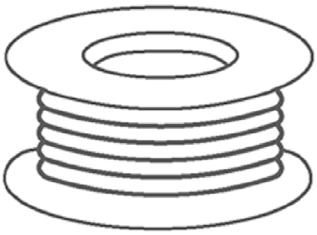
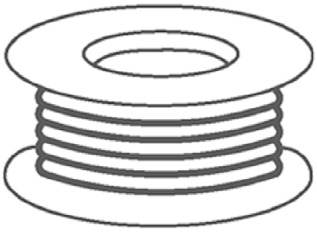
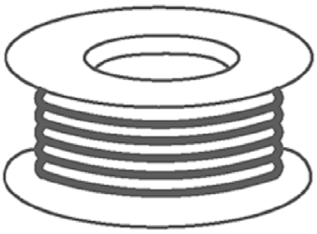
- **Pb free solder has a higher melting point than standard solder. Typically the melting point is 50 ~ 70 °F (30 ~ 40 °C) higher. Please use a high temperature soldering iron and set it to 700 ± 20 °F (370 ± 10 °C).**
- **Pb free solder will tend to splash when heated too high (about 1100 °F or 600 °C). / If you must use Pb solder, please completely remove all of the Pb free solder on the pins or solder area before applying Pb solder. If thisis not practical, be sure to heat the Pb free solder until it melts, before applying Pb solder.**
- **After applying PbF solder to double layered boards, please check the component side for excess solder which may flow onto the opposite side.**



2.1. Suggested Pb free solder

There are several kinds of Pb free solder available for purchase. This product uses Sn+Ag+Cu (tin, silver, copper) solder. However, Sn+Cu (tin, copper), Sn+Zn+Bi (tin, zinc, bismuth) solder

can also beused.

0.3mm X 100g	0.6mm X 100g	1.0mm X 100g
		

3. Service notes

NOTE

These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.

3.1. Leadless chip component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board,however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code, 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0 Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

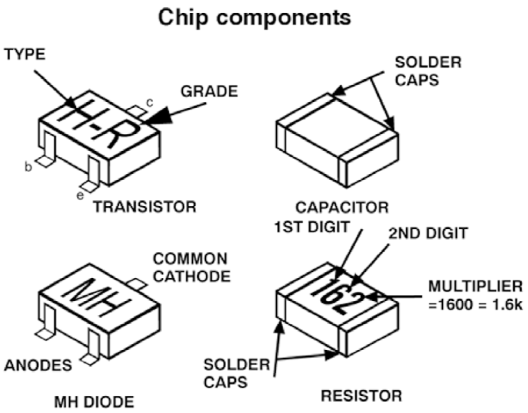
3.2. Component removal

1. **Use solder wick to remove solder from component end caps or terminal.**
2. **Without pulling up, carefully twist the component with tweezers to break the adhesive.**
3. **Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.**

3.3. Chip component installation

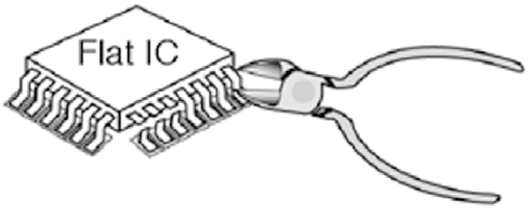
1. **Put a small amount of solder on the board soldering pads.**

2. **Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.**

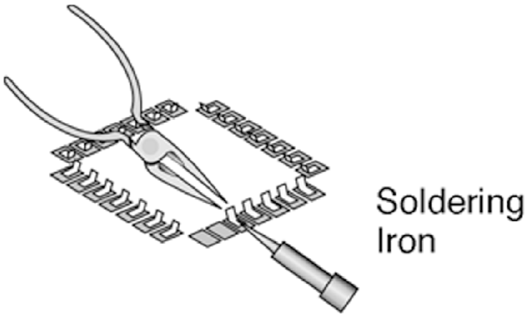

Chip components
TYPE
GRADE
c
b
e
H-R
TRANSISTOR
SOLDER CAPS
CAPACITOR
COMMON CATHODE
MH
ANODES
MH DIODE
1ST DIGIT
2ND DIGIT
162
MULTIPLIER =1600 = 1.6k
SOLDER CAPS
RESISTOR

3.4. How to replace Flat IC (required tools)

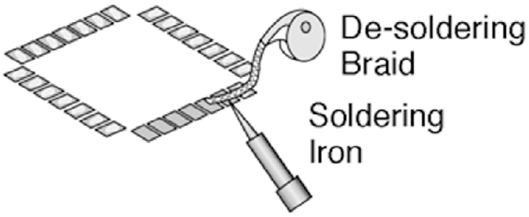
1. **Remove the solder from all of the pins of a Flat IC by using a desolder braid**



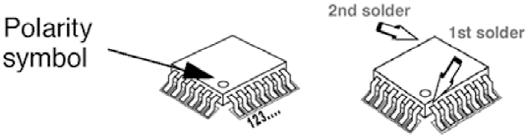
2. **Put the iron wire under the pins of the Flat IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.**


Soldering Iron

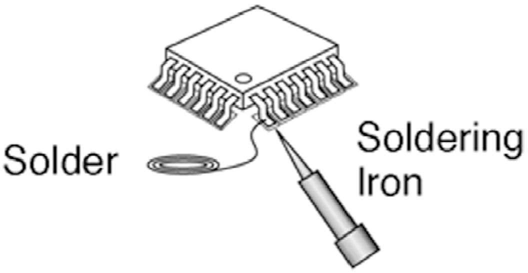
3. **Remove the solder from all the pads of the Flat IC by using a de solder braid**


De-soldering Braid
Soldering Iron

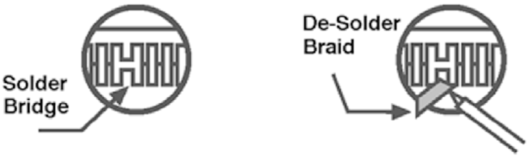
4. **Position the new Flat IC in place (apply the pins of the Flat IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol**


Polarity symbol
123....
2nd solder
1st solder

5. **Solder all pins to the soldering pads using a fine tipped soldering iron**


Solder
Soldering Iron

6. **Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de solder braid as shown in the figure below**


Solder Bridge
De-Solder Braid

IMPORTANT

To protect against possible damage to the solid state devices due to arching or static discharge, make certain that all ground wires are securely connected

CAUTION

The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground (HOTor

COLD) when servicing, or incorrect voltages will be measured.

WARNING

This receiver has been designed to meet or exceed applicable safety and x ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to x ray radiation and shock and fire hazard, parts indicated with the symbol ⚠ on the schematic must be replaced with identical parts. Order parts from the manufacturer'sparts center using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.

4. Receiver feature table

FEATURE/MODEL	CT-3233HG
CHASSIS	AP413
TUNNING SYSTEM	GEN III
CLOSE CAPTION	X
V-CHIP	X
CHANNEL COUNT	181
75 OHM INPUT	X
REMOTE	NOT INCLUDED
CRT SUPPLIER	MATSUSHITA
CHASSIS	NA8ML
COMB FILTER	3 DIG
HEC/VEC (X=BOTH)	VEC
VM	X
V/A NORM (X=BOTH)	V
COLOR TEMP	X
AUTO ON	X
MTS/SAP/DBX	X
BUILT-IN AUDIO POWER	7WX2
No. OF SPEAKERS	2
SPEAKER TYPE	DOME
BASS/BALANCE/TREBLE CONTROL	X
AI SOUND	X (ALWAYS ON)
SURROUND/BBE	BBE
A/V (REAR/FRONT)	3(2/1)
S-VHS INPUT (REAR/FRONT)	1/1
COMPONENT INPUT (REAR/FRONT)	1/0
SMART PLUG INTERFACE	SMART PLUG (RJ-11)

FEATURE/MODEL	CT-3233HG
AUDIO LINE OUT	STEREO
MISC	GEN 3 MICRO FOR SPECTRADYNE
EPJ/HPJ/MISC	HPJ

5. Board description table

MODEL	CT-3233HG	DESCRIPTION
A-BOARD	TNP2AH054	MAIN CHASSIS
D-BOARD	TNP2AH055	POWER
G-BOARD	TNPA1670AF	KEYBOARD AND FRONT A/V
L-BOARD	TNPA1673AF	CRT BOARD
DI-BOARD	TNPAA125AA	DIGITAL INTERFACE
T-BOARD	TNP2AA025AB	AUXILIARY POWER SUPPLY

NOTE
When ordering a replacement board assembly, append an “S” to the board number

EXAMPLE
To order the A-Board, the replacement board is TNP2AH054S

6. Dissasembly for service

Back cover
Remove all the screws marked with an arrow (←) from the back of the receiver

NOTE
Screw configuration, type, and number of screws vary depending on the model of the receiver serviced and the application; various models are covered in this manual. Use same hardware when reassembling the receiver.

- 4 screws at the top edge of the receiver.
- 2 screw by the A/V jacks.
- 1 screw at each lower corner of the receiver.

NOTE
Extensions for board connectors may be needed to take voltages on some boards, please see parts list section for part numbers in this service manual.

A-Board - Main chassis

The A-Board assembly rest on a chassis tray along with the D-Board.

Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. **A-Board is secured to the chassis tray with screws.**
2. **The A-Board is mated to the D-Board by four flexible connectors and to G-Board by three flexible connectors: A5, A6 & A7 (D5, D6 & D7 on the D-Board, respectively) and A1, A2 & A3 (G1, G2 & G3). To removeeither boards, unplug the connectors on the A-Board.**

NOTE
Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal

D-Board - Deflection

The D-Board assembly rest on a chassis tray along with the A-Board.
Slide chassis tray out. Gently lift the tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

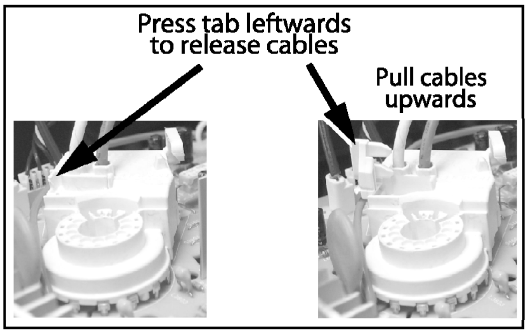
1. **D-Board is secured to the chassis tray with screws.**
2. **The D-Board is mated to the A-Board by four flexible connectors: D5, D6 and D7 (A5, A6 & A7 on the A-Board, respectively). To remove either boards, unplug the connectors on the A-Board.**

NOTE
Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal

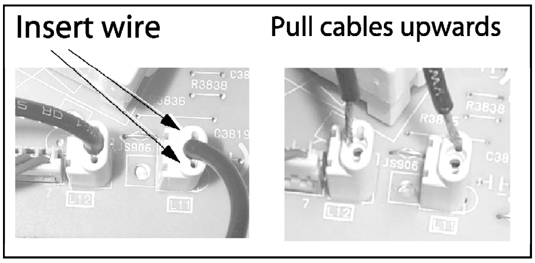
L-Board - CRT output

Plugs into the socket on the CRT neck.
To remove this board, first unplug the board from the CRT neck, then disconnect L1, L2 and L3 connectors, to disconnect the focus F1(red cable) & F2 (white cable) cables from the CRT socker, pull the tab and release the cables (see figure),there is one cable that is soldered and goes to the flyback.
To reinsert back the cables, remember the original position of cables, F1 (red cable) goes to A on the CRT socket and F2 (white cable) goes to B on the CRT socket.

F1 and F2 cables release



To release screen GND cables from L-Board L11 & L12 connectors, insert a wire in both sides of connector and pull upwards the cable, then remove the wire.



DI-Board

The DI-Board is assembled to a metal bracket with two screws and this metal bracket is assembled to the main chassis (A-Board) with two screws, this board is plugged at the A31 and A32 (DI6 and DI5 respectively) connectors.

T-Board

1. **This board is located on the right side or the cabinet.**
2. **Is assembled to a metal bracket with four screws and this metal bracket is assembled to the cabinet with three screws; be careful to do not screw too tight, otherwise this grommet screw hole will get stripped; Unpplug all connectors to removethis board.**

G-Board

Mated to A-Board by three flexible connectors A1, A2, A3 . (G1, G2 & G3). To remove this board, first unplug the three flexible connectors, then RT1, RT2, G4 connectors, then pull upwards the board while unlock the tabs from the chassistray.

Speakers

Each speaker is secured to a plastic bracket with 4 screws, and each plastic bracket is secured to the cabinet with two screws.

NOTE

When reassembling speakers be sure to connect the speaker wires to the correct speaker lead (+) (-)

6.1. Disassembly for CRT replacement

1. **Discharge the CRT as instructed in the "safety precautions" section and remove 2nd anode button from the CRT.**
2. **Remove speaker modules (R and L)**
3. **Perform complete removal of chassis, as instructed in "disassembly for service" section.**

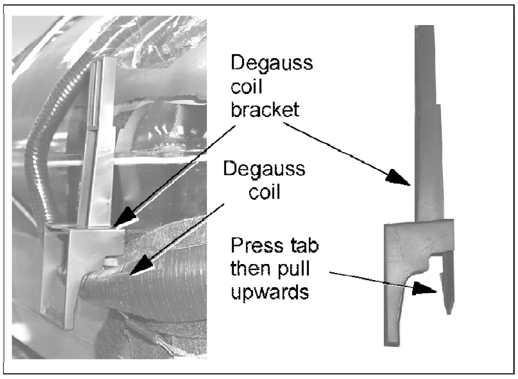
NOTE
When remounting the CRT, reuse the metal sheet located in the lower part of the cabinet holding the CRT, hold with screws to the cabinet. This metal sheet is not supplied with the CRT replacement.

CRT replacement

1. **Perform "disassembly for CRT replacement" procedure.**
2. **Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the "safety precautions" section on handling the picture tube.**
3. **Remove the components from the CRT neck and place the cabinet face down on a soft pad.**
4. **Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.**
5. **Remove the CRT with the degaussing coil and the dag ground braid attached.**

NOTE
To remove the four brackets holding the degauss coil from the corners of the CRT, first remove the CRT from the cabinet, then remove the brackets by pressing the tab on the bracket and pull upwards. These brackets are included in the degauss coilkit, for part number, please see parts list section.

Brackets removal



6. Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.
To remove and remount the degaussing coil:

- **Unhook the coil spring from the bottom corners of the CRT ears.**
- **Release the braid loop from the upper corners of the CRT ears.**

7. Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties.
Dress coil as was on the original CRT.

8. Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.

NOTE

Reuse all the clampers and mounting brackets from the degauss coil and screen, and when remounting the degauss coil assure that is not touching the speakers, this can be done by placing some tape, this may cause mask vibration. The mounting brackets andclampers are not supplied with the replacements.

IMPORTANT NOTICE

When ordering the CRT, please order CRT and CRT kit also.
Please see parts list section for part numbers

7. Clone box use

The clone box uploads (LEARN) the settings of one television and downloads (TEACH) them to other televisions. This places the television into hotel mode.

NOTE:

The clone box is not supplied with the set. It can be purchased separately.

7.1. Setting the “ Master ” television

The features listed in the HOTEL mode table must be adjusted before clonning can begin.

1. Turn the television ON.

2. Access the main menu by pressing the ACTION button.

3. Access the SET UP menu.

- **Use the CH and VOL buttons to highlight the SET UP icon, then press the ACTION button**
- **Use the CH buttons to highlight AUTO PROG (auto channel programming), then press the VOL button to begin programming.**

NOTE:
This step is mandatory.

- **If necessary, use MANUAL PROG (manual channel programming) to delete any undesired channels.**
- **Press the ACTION button to return to the main menu.**

4. If necessary, access the PICTURE menu.

- **Use the CH and VOL buttons to highlight the Picture icon, then press the ACTION button.**
- **Use the CH buttons to highlight a feature, then press the VOL buttons to adjust them.**
- **Press the ACTION button to return to the Main Menu.**

5. If desired, access the CHANNELS menu

- **Use the CH and VOL buttons to highlight CHANNELS icon, then press the ACTION button.**
- **Highlight MANUAL CAPTION and press VOL → .**
- **Use numeric keypad or Vol buttons to select desired channels. Use the CH buttons to highlight the character position, then press the VOL buttons to select characters for the channel caption.**
- **Press the ACTION button to return to the Main Menu.**

6. If desired, access the SET UP menu to set the Energy Management feature. This feature lets you program the television to turn OFF after a pre-determined period of time from the last keyed-in instruction (pressing any buttons on the TV or onthe remote control) received by the television.

   - Use the CH and VOL buttons to highlight the Setup icon, then press the ACTION button.
   - Use the CH buttons to highlight the Energy Management feature.
   - Press VOL ← or → button to select OFF or 1 through 15 Hours.
7. Exit the main menu by pressing the ACTION button.
8. If necessary, set the maximum volume level.
9. If the hotel has hotel "barker" channel, tune the set to the "barker" channel.

NOTE:
AUTO POWER ON feature setting, audio settings and Channels menu settings can also be cloned.

7.2. Uploading television settings into the clone box (LEARN)

1. Press the POWER ON button on the clone box.
   - The LEDs will flash red and green to confirm power is ON.
2. Connect the clone box to the digital Interface port on the back of the television.
   - The television must be plugged into an AC outlet but can be either OFF or ON.
3. Hold the ALT button while pressing the LEARN button.
   - The red LED will flash while the data is uploaded to the box. The green LED will light for about two (2) seconds when the procedure is complete.

   NOTE:
   The television is now in HOTEL mode.

4. Disconnect the clone box from the television and turn it OFF.

NOTE:
Data is not lost even if the battery is removed.

7.3. Downloading settings into other televisions (TEACH)

1. Press the POWER ON button on the clone box.

   - The LEDs will flash red and green to confirm power is ON.

2. Connect the clone box to the digital Interface port on the back of the television.

   - The television must be plugged into an AC outlet but can be either OFF or ON.

3. Press the TEACH button.

   - The green LED will flash while data is downloaded to the television. The green LED will light for about two (2) seconds when the procedure is complete.

   NOTE:
   The television is now in HOTEL mode.

4. Disconnect the clone box from the television and turn it OFF.
5. Repeat steps 1 through 4 to set up other televisions.

7.4. Setting individual volume limits

This procedure allows the maximum volume level to be changed on individual televisions.

7.4.1. For lower volume

The television must be in HOTEL mode.

1. Turn television ON.
2. Adjust the television volume to desired level.

NOTE:
This will become the new maximum volume level

3. Press the POWER ON button on the clone box.

- The LEDs will flash red and green to confirm power is ON.

4. Connect the clone box to the Digital Interface port on the back of the television.
5. Hold the ALT button while pressing the LEARN button on the clone box.

   - The red LED will flash while the data is uploaded into the box. The green LED will light for about two (2) seconds when the procedure is complete.

6. Disconnect the clone box from the television and turn it OFF.
7. Reset the volume on the television.
8. Refer to the section entitled Downloading Settings into Other Televisions (TEACH).

7.4.2. For higher volume

The television must be in Normal TV mode. Refer to the section entitled Resetting the Television to Normal TV mode.

1. Turn television ON.
2. Adjust the television volume to the minimum setting.
3. Press the POWER ON button on the clone box.

   - The LEDs will flash red and green to confirm power is ON.

4. Connect the clone box to the digital Interface port on the back of the television.
5. Adjust the television volume to maximum desired level.
6. Hold the ALT button while pressing the LEARN button on the clone box

   - The red LED will flash while the data is uploaded into the box. The green LED will light for about two (2) seconds when the procedure is complete.
   - If the green LED does not light for about two (2) seconds, retry by holding the ALT button while pressing the LEARN button.

7. Disconnect the clone box from the television and turn it OFF.

8. **Reset the volume on the television.**
9. **Refer to the section entitled downloading settings into other televisions (TEACH).**

7.5. Testing the settings in the clone box

This test compares the clone box settings with the television settings. The television must be in HOTEL mode

1. **Press the POWER ON button on the clone box.**

   - The LEDs will flash red and green to confirm power is ON.

2. **Connect the clone box to the digital Interface port on the back of the television.**

   - The television must be plugged into an AC outlet but can be either OFF or ON.

3. **Press the TEST button.**

   - The LEDs will flash red and green while the data is compared. The green LED will light for about two (2) seconds if the settings in the box match the television.

4. **Disconnect the clone box from the television and turn it OFF.**

7.6. Testing the clone box battery

1. **Press the POWER ON button on the clone box.**

   - The LEDs will flash red and green to confirm power is ON.

2. **Hold the ALT button while pressing the TEST button.**

   - The LEDs will alternately flash red and green while the box is tested.

   NOTE:
   Replace the 9 volt battery if the LEDs do not flash red and green.

   - The green LED will light for about two (2) seconds, if battery is charged.

   NOTE:
   If the green LED does not light for about two (2) seconds at the end of the test, new data must be downloaded into the box.

7.7. Resetting the television to normal TV mode

1. Press the POWER ON button on the clone box

    - The LEDs will flash red and green to confirm power is ON

2. Connect the clone box to the digital Interface port on the back of the television.

    - The television must be plugged into an AC outlet but can be either OFF or ON

3. Press the AMS button.

NOTE:
Insert a slender tool about 3/4 inch (paper clip) into the opening.

    - The green LED will flash while the television is reset to TV mode. The green LED will light for about two (2) seconds when the procedure is complete.

4. Disconnect the clone box from the television and turn it OFF.

5. Press the ACTION + POWER buttons on the front of the set for 5 seconds to reset the TV to factory default mode. Any programed channel, channel caption and other user defined settings will be lost.

7.8. Setting the television without a clone box

7.8.1. Switching to hotel mode

Adjust the features listed in the HOTEL mode feature chart before switching modes.

1. Press the ACTION and the VOL → buttons on the front control panel simultaneously.

2. Within a second, press the ACTION and the CH ↑ buttons on the front control panel simultaneously.

3. ON will flash in red in the lower corner of the screen, indicating HOTEL mode.

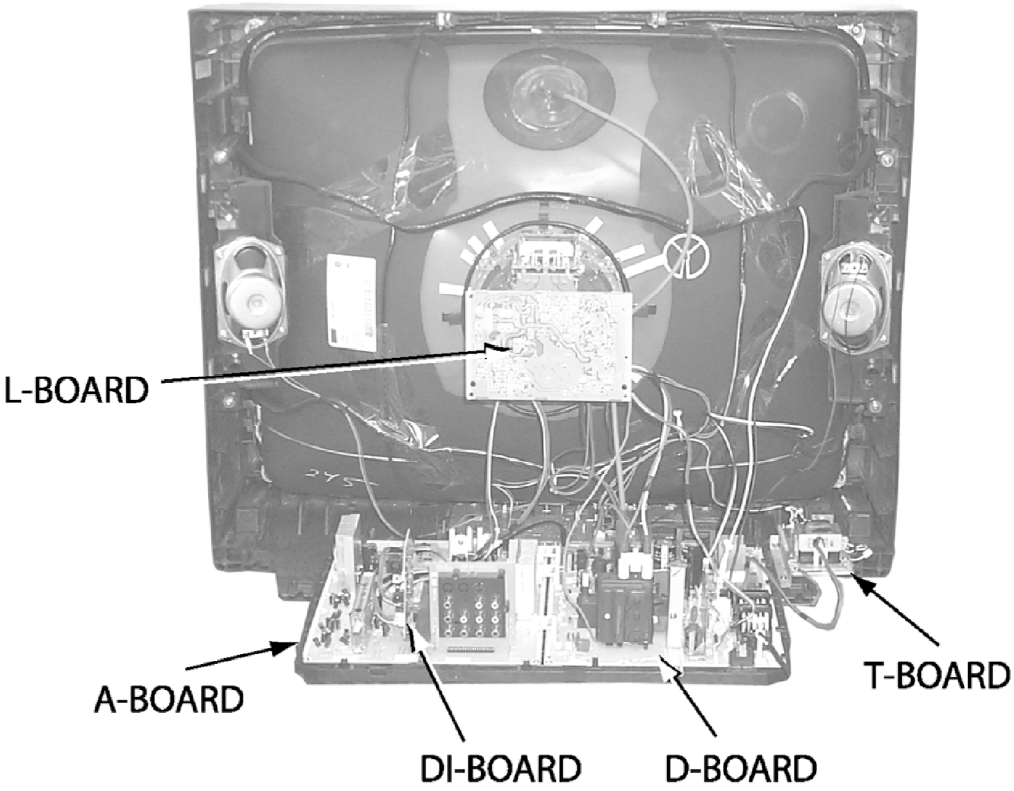
7.8.2. Switching to normal TV mode

1. Repeat steps 1 and 2 from the previous section.

2. **OFF will flash in red in the lower corner of the screen, indicating normal TV mode.**

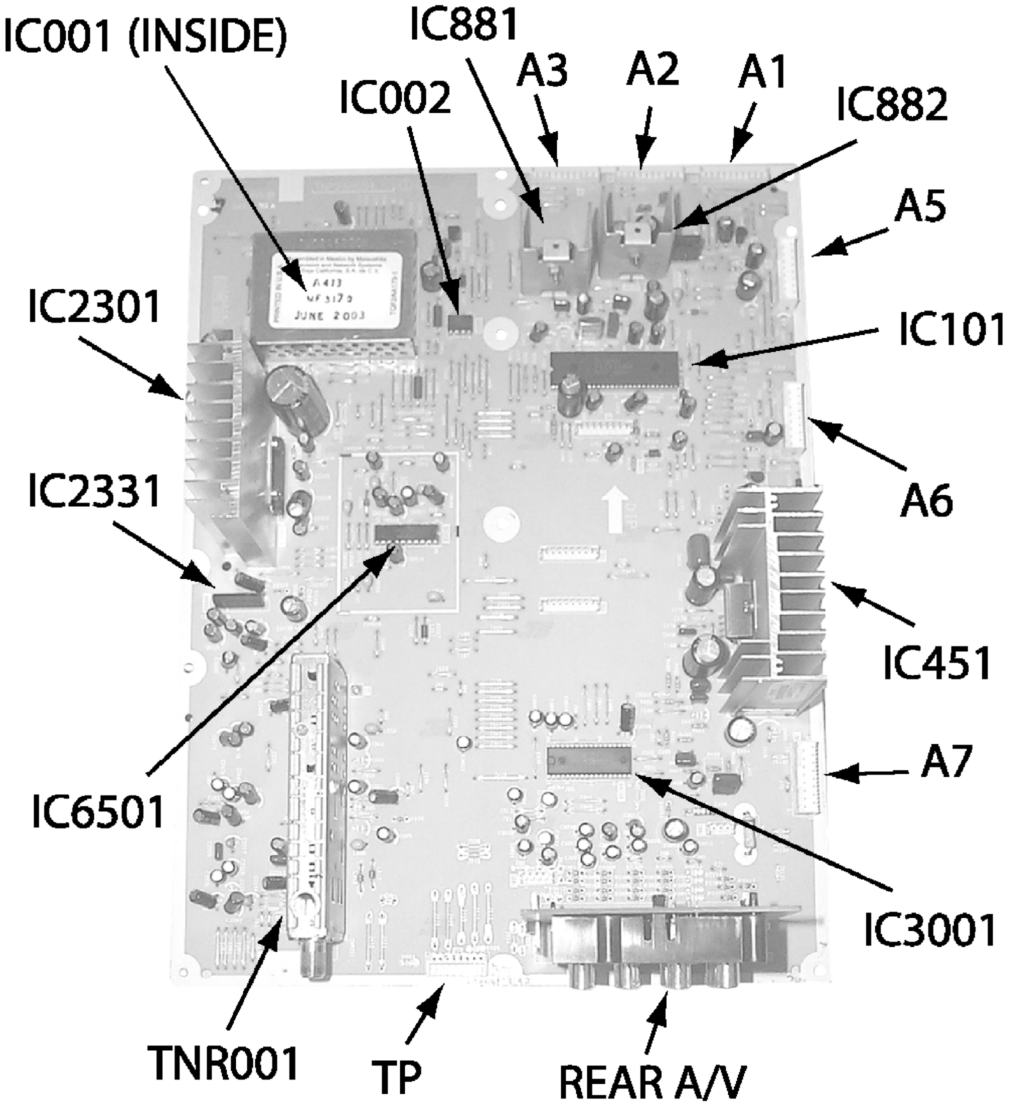
8. Identification of main components

8.1. TV with back cover removed


L-BOARD
A-BOARD
DI-BOARD
D-BOARD
T-BOARD

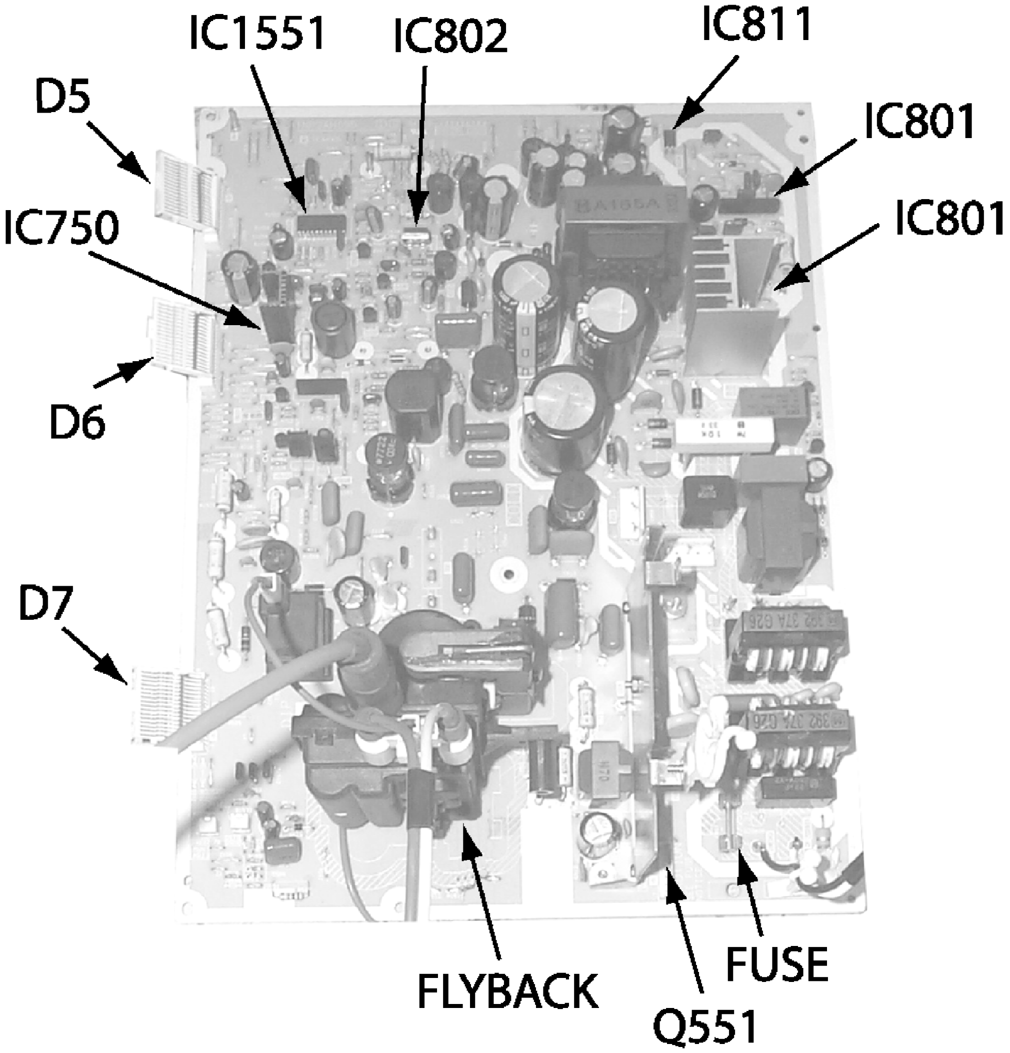
8.2. A-Board main components

A-Board main components


IC001 (INSIDE)
IC881
A3
A2
A1
IC002
IC882
A5
IC2301
IC101
A6
IC2331
IC451
A7
IC6501
IC3001
TNR001
TP
REAR A/V

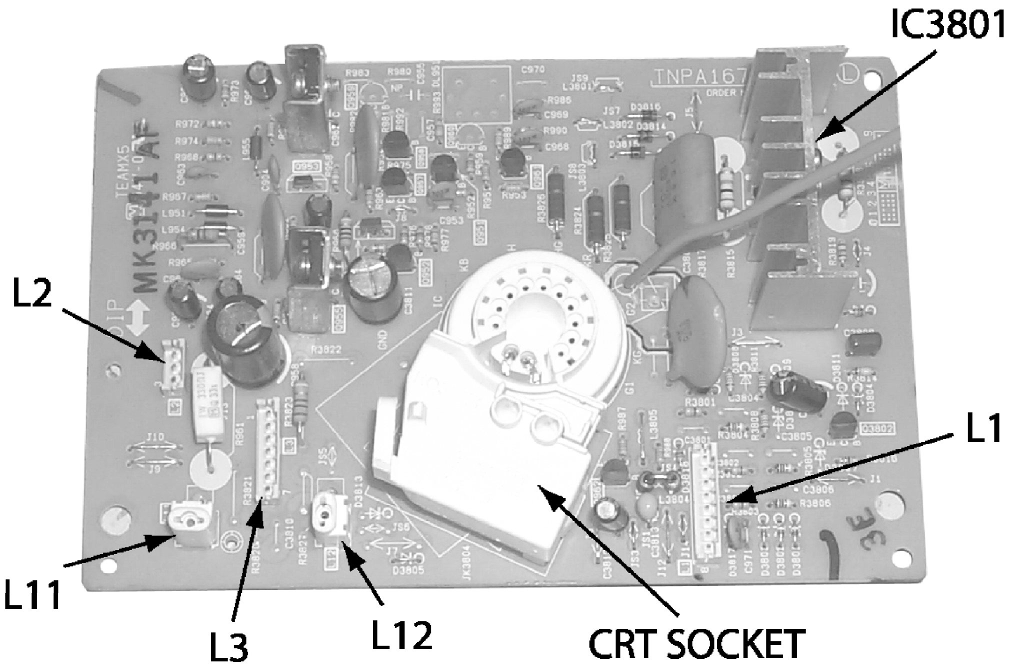
8.3. D-Board main components

D-Board main components


IC1551
IC802
IC811
D5
IC801
IC801
IC750
D6
D7
FLYBACK
FUSE
Q551

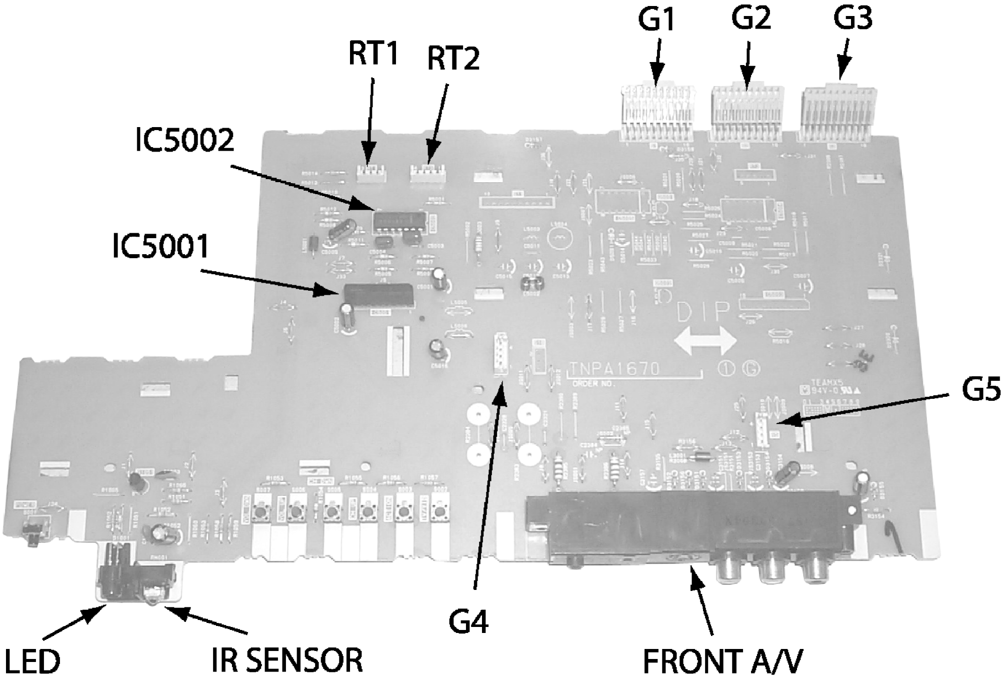
8.4. L-Board main components

L-Board main components


IC3801
L2
L1
L11
L3
L12
CRT SOCKET

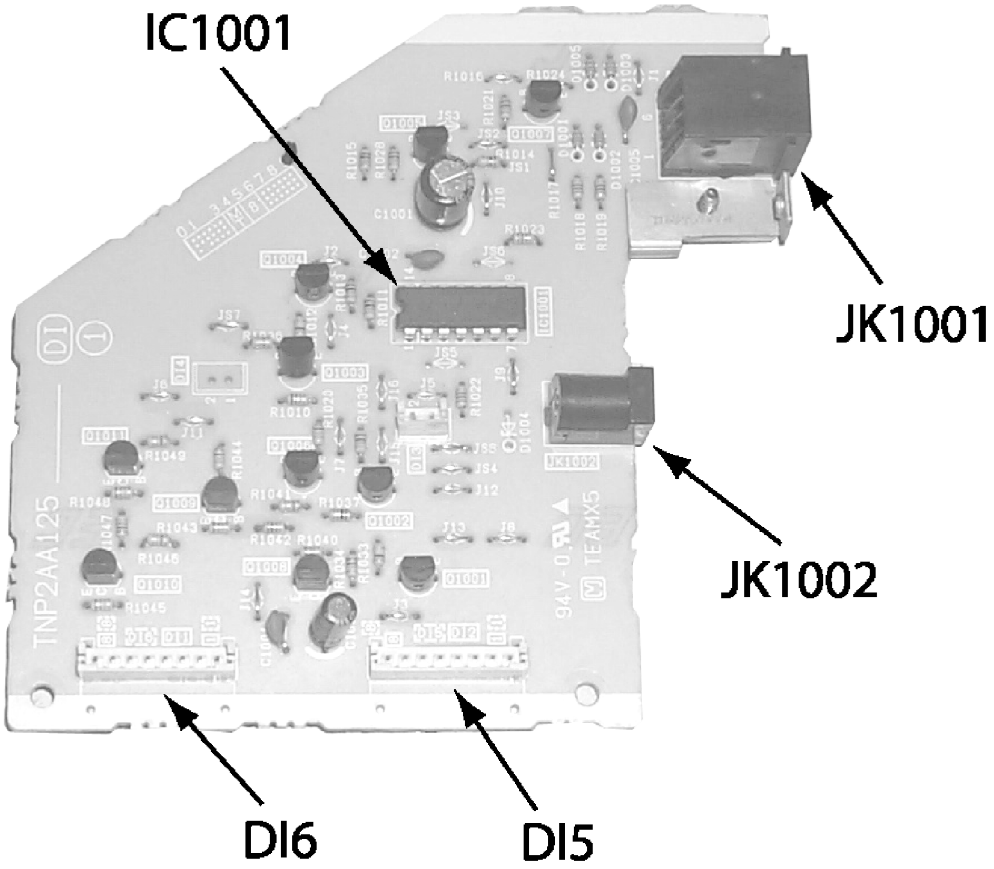
8.5. G-Board main components

G-Board main components


G1
G2
G3
RT1
RT2
IC5002
IC5001
G5
LED
IR SENSOR
G4
FRONT A/V

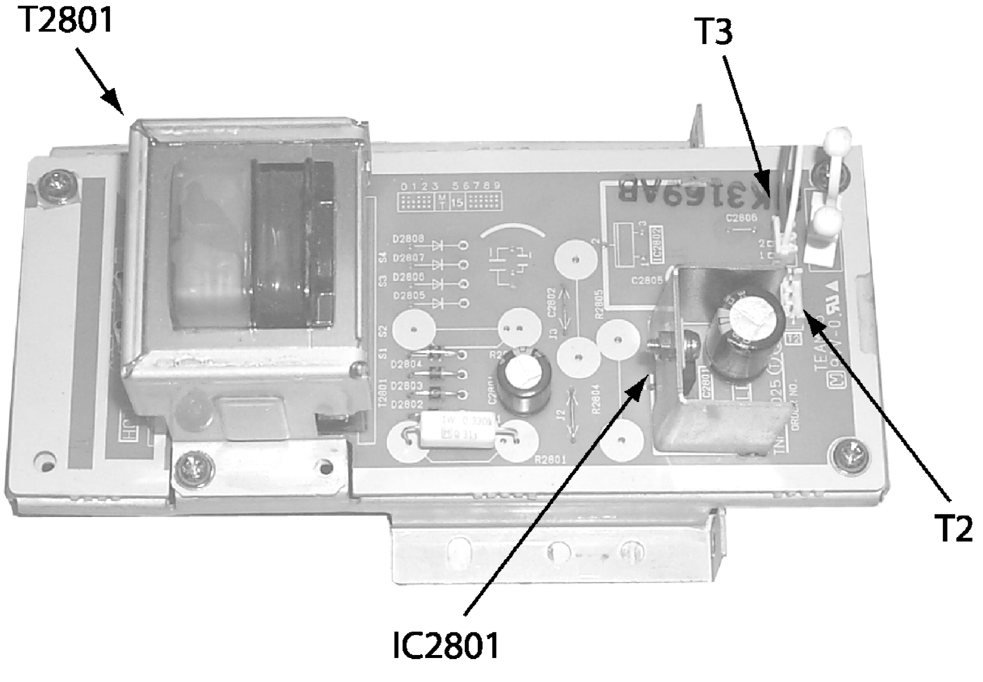
8.6. DI-Board main components

DI-Board main components


IC1001
JK1001
JK1002
DI6
DI5

8.7. T-Board main components

T-Board main components


T2801
T3
T2
IC2801

9. Reference of PDF links color

DESCRIPTION OF PDF LINK COLORS	
TYPE	**DESTINATION**
SCHEMATIC	
YELLOW ON IC	IC ON PCB
YELLOW ON CONNECTOR	CONNECTOR ON PCB
YELLOW ON SCHEMATIC	PCB
CYAN	WAVEFORM
GREEN ON SIDE	SCHEMATIC CONTINUED
GREEN ON CONNECTOR	CONNECTOR CONNECTION
BLUE ON IC	VOLTAGE
PCB	
BLUE ON IC	IC ON SCHEMATIC
BLUE ON CONNECTOR	CONNECTOR ON SCHEMATIC
BLUE ON PCB	SCHEMATIC
GREEN ON SIDE	PCB CONTINUED
BLOCK DIAGRAMS	
GREEN ON IC	IC ON SCHEMATIC
GREEN ON SIDE	BLOCK DIAGRAM CONTINUED

10. Conductor views

10.1. A-Board 1 of 2

10.2. A-Board 2 of 2

10.3. D-Board 1 of 2

10.4. D-Board 2 of 2

10.5. G-Board 1 of 2

10.6. G-Board 2 of 2

10.7. DI-Board

10.8. L-Board

10.9. T-Board

11. Block diagrams

11.1. Audio block diagram

11.2. Video block diagram

12. Schematics

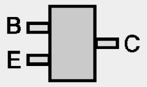
12.1. Notes in english

Notes:

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

CHIP TRANSISTOR LEAD DESIGNATION



SCHEMATIC NOTES

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ● ; Test point but no pin ○.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⊥ indicates COLD GROUND.

NOTE: All other component symbols are used for engineering design purposes.

VOLTAGE MEASUREMENTS

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter.
   Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

WAVEFORM MEASUREMENTS

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to “MIN”.
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

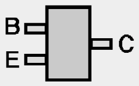
12.2. Notas en español

Notas

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



NOTAS DE LOS DIAGRAMAS

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ● Los puntos de prueba fuera de los componentes se indican con ○.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⊥ indica conexión a **Tierra Fría**.

NOTA: Los demas símbolos de componentes incluidos son usados con fines de diseño.

MEDICIÓN DE VOLTAJES

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo ⏚ indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: SI no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

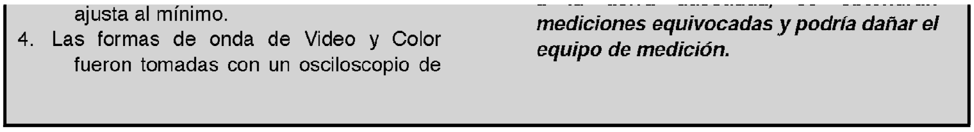
MEDICIÓN DE FORMAS DE ONDA

1. Un símbolo como ③ indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.

banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.

5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán



ajusta al mínimo.

4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de

mediciones equivocadas y podría dañar el equipo de medición.

12.3. A-Board electric schematic 1 of 4

12.4. A-Board electric schematic 2 of 4

12.5. A-Board electric schematic 3 of 4

12.6. A-Board electric schematic 4 of 4

12.7. D-Board electric schematic 1 of 2

12.8. D-Board electric schematic 2 of 2

12.9. L-Board Schematic 1 of 2

12.10. L-Board Schematic 2 of 2

12.11. G-Board schematic 1 of 2

12.12. G-Board schematic 2 of 2

12.13. DI-Board schematic 1 of 2

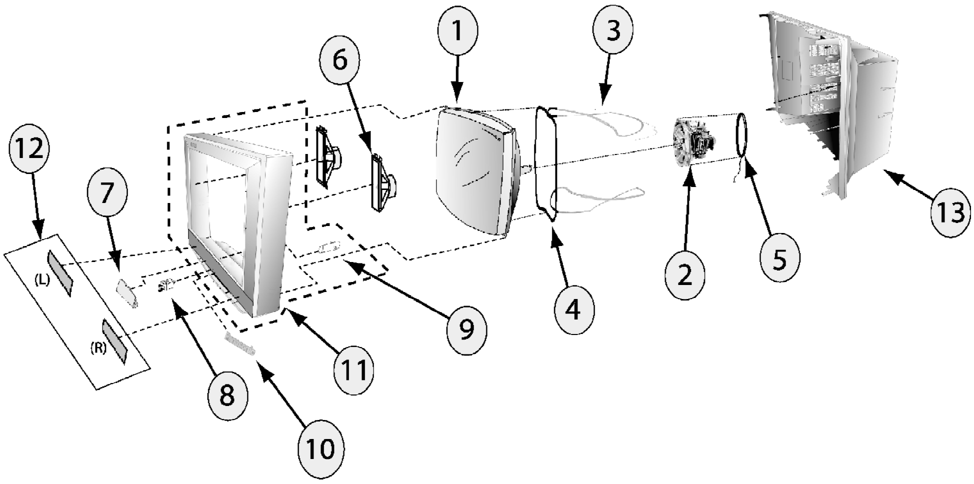
12.14. DI-Board schematic 2 of 2

12.15. T-Board schematic

12.16. Voltages

12.17. Waveforms

13. Parts location



14. Parts list

14.1. Description of abbreviations guide

Important Safety Notice

Components identified by ⚠ mark have special characteristics important for safety.
When replacing any of these components, use manufacturer's specified parts.

Abbreviation of part name and description

1. Resistor

Example :
ERD25TJ104 **C** 100KΩ, **J**, 1/4W
Type Allowance

Type	Allowance
C : Carbon	F : ± 1%
F : Fuse	G : ± 2%
M : Metal Oxide Metal Film	J : ± 5% K : ± 10%
S : Solid	M : ± 20%
W : Wire Wound	

2. Capacitor

Example :
ECKF1H103ZF **C** 0.01μF, **Z**, 50V
Type Allowance

Type	Allowance
C : Carbon	C : ± 0.25pF
E : Electrolytic	D : ± 0.5pF
P : Polyester Polypropylene	F : ± 1pF G : ± 3%
T : Tantalum	J : ± 5%
	K : ± 10%
	L : ± 15%
	M : ± 20%
	P : ± 100%, -0%
	Z : ± 80%, -20%

14.2. Parts list

Ref. No.	Part No.	Part Name & Description	Remarks
CAPACITORS			
C001	ECA1CM470B	CAP E 47UF-16V	
C002	TCJ2VB1H103K	CAP C .01UF-K-50V	
C005	ECA1CM470B	CAP E 47UF-16V	
C006	TCJ2VB1H103K	CAP C .01UF-K-50V	
C008	TCJ2VB1H103K	CAP C .01UF-K-50V	
C009	TCJ2VC1H101J	CAP C 100PF-J-50V	
C010	TCJ2VB1H103K	CAP C .01UF-K-50V	
C012	ECA1HM220B	CAP E 22UF-50V	
C013	ECA0JM101B	CAP E 100UF-6.3V	
C014	TCJ2VC1H390J	CAP C 39PF-J-50V	
C015	TCJ2VC1H120J	CAP C 12PF-J-50V	
C017	TCJ2VC1H270J	CAP C 27PF-J-50V	
C018	TCJ2VC1H270J	CAP C 27PF-J-50V	
C020	ECA0JM331B	CAP E 330UF-6.3V	
C024	ECA1HM4R7B	CAP E 4.7UF-50V	
C025	ECA1HM010B	CAP E 1UF-50V	
C026	ECA1HM010B	CAP E 1UF-50V	
C033	TCJ2VC1H680J	CAP C 68PF-J-50V	
C034	TCJ2VC1H680J	CAP C 68PF-J-50V	
C043	ECA1HM2R2B	CAP E 2.2UF-50V	
C044	TCJ2VB1H103K	CAP C .01UF-K-50V	
C045	TCJ2VB1H103K	CAP C .01UF-K-50V	
C047	ECA0JM102B	CAP E 1000UF-6.3V	
C048	TCJ2VB1H103K	CAP C .01UF-K-50V	
C049	TCJ2VB1H103K	CAP C .01UF-K-50V	
C059	ECA1HM4R7B	CAP E 4.7UF-50V	
C075	TCJ2VC1H390J	CAP C 39PF-J-50V	
C076	TCJ2VC1H390J	CAP C 39PF-J-50V	
C077	TCJ2VC1H390J	CAP C 39PF-J-50V	
C201	ECJ2VB1C104K	CAP C .1UF-K-16V	
C224	ECJ2VB1C104K	CAP C .1UF-K-16V	
C225	ECJ2VB1C104K	CAP C .1UF-K-16V	
C226	ECJ2VB1C104K	CAP C .1UF-K-16V	
C301	ECJ2VB1C104K	CAP C .1UF-K-16V	
C302	ECJ2VB1C104K	CAP C .1UF-K-16V	
C303	ECJ2VB1C104K	CAP C .1UF-K-16V	
C307	ECA1HM0R1B	CAP E .1UF-50V	
C310	TCJ2VC1H390J	CAP C 39PF-J-50V	
C315	EEANA1E1R0B	CAP E 1.0UF-25V	
C320	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C321	TCJ2VB1H103K	CAP C .01UF-K-50V	
C322	TCJ2VB1H103K	CAP C .01UF-K-50V	
C323	TCJ2VB1H103K	CAP C .01UF-K-50V	
C324	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C330	ECA1AM101B	CAP E 100UF-10V	
C331	TCJ2VF1H103Z	CAP C .01UF-Z-50V	
C337	ECA1HM2R2B	CAP E 2.2UF-50V	
C342	ECA1HM010B	CAP E 1UF-50V	
C401	ECJ2VB1C104K	CAP C .1UF-K-16V	
C402	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C403	ECA1HM010B	CAP E 1UF-50V	
C404	ECA1HM010B	CAP E 1UF-50V	
C405	ECSF1EE105VB	CAP E 1.0UF-25V	

Ref. No.	Part No.	Part Name & Description	Remarks
C407	**ECA1HM220B**	**CAP E 22UF-50V**	
C409	**TCJ2VC1H101J**	**CAP C 100PF-J-50V**	
C410	**ECJ2VB1C104K**	**CAP C .1UF-K-16V**	
C415	**ECJ2VF1H104Z**	**CAP C .1UF-Z-50V**	
C453	**EEUNA1E220B**	**CAP E 22UF-25V**	
C454	**ECA1HHG221B**	**CAP E 220UF-50V**	
C456	**ECQB1104JF3**	**CAP P .10UF-J-100V**	
C458	**ECQB1H472JF3**	**CAP P 4700PF-J-50V**	
C459	**ECQB1224KF3**	**CAP P .22UF-K-100V**	
C460	**ECA1EM222E**	**CAP E 2200UF-25V**	
C461	**ECA1VM470B**	**CAP E 47UF-35V**	
C462	**ECA1EM102E**	**CAP E 1000UF-25V**	
C463	**ECQB1H103JF3**	**CAP P .01UF-J-50V**	
C465	**ECA1CM101B**	**CAP E 100UF-16V**	
C470	**ECQB1H104JF3**	**CAP P .10UF-J-50V**	
C471	**ECQB1H104JF3**	**CAP P .10UF-J-50V**	
C495	**ECQB1H683JF3**	**CAP P .068UF-J-50V**	
C501	**ECQB1H681JF3**	**CAP P 680PF-J-50V**	
C502	**ECA1HMR22B**	**CAP E .22UF-50V**	
C503	**TCJ2VC1H151J**	**CAP C 150PF-J-50V**	
C504	**ECKR2H152KB5**	**CAP C .0015UF-K-500V**	
C505	**TCJ2VC1H180J**	**CAP C 18PF-J-50V**	
C506	**ECA1CM471B**	**CAP E 470UF-16V**	
C507	**TCJ2VB1H103K**	**CAP C .01UF-K-50V**	
C508	**ECJ2VF1H104Z**	**CAP C .1UF-Z-50V**	
C509	**ECKR3A681KBP**	**CAP C 680PF-K-1KV**	
C510	**TCJ2VC1H101J**	**CAP C 100PF-J-50V**	
C511	**ECWH20272JVY**	**CAP P 2700PF-J-2KV**	⚠
C512	**ECKR2H332KB5**	**CAP C 3300PF-K-550V**	
C513	**ECQF4153JZH**	**CAP P .015UF-J-400V**	⚠
C514	**ECWH20133JVB**	**CAP P 13000PF-J-2KV**	⚠
C518	**ECKW3D681KBR**	**CAP C 680PF-K-2KV**	⚠
C519	**ECKW3D681KBR**	**CAP C 680PF-K-2KV**	⚠
C520	**ECQB1H153JF3**	**CAP P .015UF-J-50V**	⚠
C522	**ECKW3D331JBR**	**CAP C 330PF-J-2KV**	⚠
C523	**ECWH20362JVY**	**CAP P 3600PF-J-2KV**	⚠
C524	**ECQB1224JF3**	**CAP P .22UF-J-100V**	
C525	**ECA1HMR22B**	**CAP E .22UF-50V**	
C526	**ECA2EM470E**	**CAP E 47UF-250V**	⚠
C527	**ECKR2H102KB5**	**CAP C 1000PF-K-500V**	
C528	**ECA1HM4R7B**	**CAP E 4.7UF-50V**	⚠
C531	**ECA160V33UE**	**CAP E 33UF-160V**	⚠
C532	**ECQF4273JZH**	**CAP P .027UF-J-400V**	⚠
C537	**ECEA2CNR47SB**	**CAP E .47UF-160V**	
C553	**ECWF2105JSR**	**CAP P 1UF-J-200V**	
C554	**ECA1AM222E**	**CAP E 2200UF-10V**	
C555	**TCJ2VB1H103K**	**CAP C .01UF-K-50V**	
C557	**TCJ2VB1H103K**	**CAP C .01UF-K-50V**	
C569	**ECWF2244JSR**	**CAP M .22UF-J-200V**	
C572	**ECWF2474JSR**	**CAP P .47UF-J-200V**	
C573	**ECQE2474KFB**	**CAP P .47UF-K-200V**	
C574	**ECA1HM470B**	**CAP E 47UF-50V**	

Ref. No.	Part No.	Part Name & Description	Remarks
C575	ECQV1H334JL3	CAP P .33UF-J-50V	
C595	ECA1HM100B	CAP E 10UF-50V	
C601	TCJ2VB1H103K	CAP C .01UF-K-50V	
C603	ECQB1H223JF3	CAP P .022UF-J-50V	
C616	ECJ2VB1C104K	CAP C .1UF-K-16V	
C619	TCJ2VB1H103K	CAP C .01UF-K-50V	
C628	TCJ2VC1H151J	CAP C 150PF-J-50V	
C632	TCJ2VB1H103K	CAP C .01UF-K-50V	
C641	ECA1HM100B	CAP E 10UF-50V	
C701	TCJ2VB1H103K	CAP C .01UF-K-50V	
C750	ECKR1H181KB5	CAP C 180UF-K-50V	
C751	ECQE1335KFB	CAP P 3.3UF-K-100V	
C752	ECA1VM470B	CAP E 47UF-35V	
C753	ECQB1H222JF3	CAP P 2200PF-J-50V	
C754	TACCW332T50V	CAP C .0033F-50V	
C755	ECQB1H273JF3	CAP P .027UF-J-50V	
C756	ECKR2H332KB5	CAP C 3300PF-K-550V	
C757	ECQB1H682JF3	CAP P 6800PF-J-50V	
C763	ECKR3A121KBP	CAP C 120PF-K-1KV	
C801	ECQU2A224MVA	CAP P .22UF-M-250V	⚠
C802	ECQU2A823MNB	CAP P .082UF-M-250V	
C803	ECQB1H222JF3	CAP P 2200PF-J-50V	
C804	EC0S2DA821CB	CAP E 820UF-200V	⚠
C805	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C806	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C807	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C808	ECKW2H472PU7	CAP C 4700PF-P-500V	⚠
C809	ECQB1H333JF3	CAP P .033UF-J-50V	
C810	ECQB1H102JF3	CAP P 1000PF-J-50V	
C811	EC0S2DA821DB	CAP E 820UF-200V	⚠
C815	ECA1EM471B	CAP E 470UF-25V	
C817	ECQB1H332JF3	CAP P 3300PF-J-50V	
C819	TACCQ221T50V	CAP C 220PF-J-50V	
C820	ECA1EHG471B	CAP E 470UF-25V	
C821	ECKW3D222KBP	CAP C 2200UF-K-2KV	
C822	ECQB1H393JF3	CAP P .039UF-J-50V	
C826	ECA1CM222E	CAP E 2200UF-16V	
C827	ECQB1H333JF3	CAP P .033UF-J-50V	
C829	ECA1HHG102E	CAP E 1000UF-50V	
C830	EC0S2CA102CB	CAP E 1000UF-160V	⚠
C831	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C832	ECA1CM221B	CAP E 10UF-16V	
C833	ECKR3A471KBP	CAP C 470PF-K-1KV	
C834	ECA1CM332E	CAP E 3300UF-16V	
C836	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C837	ECA1EM222E	CAP E 2200UF-25V	
C839	ECKR3A151KBP	CAP C 150PF-K-1KV	
C840	ECA1EM222E	CAP E 2200UF-25V	
C841	ECA1EM102E	CAP E 1000UF-25V	
C842	ECKR3A331KBP	CAP C 330PF-K-1KVDC	
C843	ECA1VM102E	CAP E 1000UF-35V	
C844	ECKR3A471KBP	CAP C 470PF-K-1KV	
C845	ECA1CM101B	CAP E 100UF-16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C846	ECA1HM010B	CAP E 1UF-50V	
C848	ECA1CM101B	CAP E 100UF-16V	
C852	ECKCNB102MB	CAP C 1000PF-M-250V	⚠
C853	ECKCNB102MB	CAP C 1000PF-M-250V	⚠
C854	ECKCNB472ME	CAP C 4700PF-M-250V	⚠
C855	ECKCNB472ME	CAP C 4700PF-M-250V	⚠
C881	ECA1CM101B	CAP E 100UF-16V	
C883	ECA1CM101B	CAP E 100UF-16V	
C885	ECA1CM471B	CAP E 470UF-16V	
C886	ECA1CM102B	CAP E 1000UF-16V	
C888	ECA1CM471B	CAP E 470UF-16V	
C889	ECA1CM221B	CAP E 10UF-16V	
C895	ECA1EM101B	CAP E 100UF-25V	
C904	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C952	ECA1HM100B	CAP E 10UF-50V	
C953	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C958	ECA2CM470E	CAP E 47UF-160V	
C959	ECKW2H103KB5	CAP C .01UF-K-500V	
C960	ECCR2H151J5	CAP C 150-500V	
C961	ECA2AM100B	CAP E 10UF-100V	
C962	ECKW2H103KB5	CAP C .01UF-K-500V	
C963	ECCR1H151J5	CAP DISC 150-5-50V	
C964	ECA1CHG101B	CAP E 100UF-16V	
C966	ECA1CHG101B	CAP E 100UF-16V	
C967	ECA1CM221B	CAP E 10UF-16V	
C968	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C969	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C971	ECKR1H222KB5	CAP C 2200PF-K-50V	
C1001	ECA1CM471E	CAP E 470UF-16V	
C1002	ECKR1H103ZF5	CAP C .01UF-50V	
C1003	ECA0JM101B	CAP E 100UF-6.3V	
C1004	ECKR1H103ZF5	CAP C .01UF-50V	
C1005	ECKR1H103ZF5	CAP C .01UF-50V	
C1051	ECKR1H103ZF5	CAP C .01UF-50V	
C1052	ECA1HM470B	CAP E 47UF-50V	
C1063	ECCR1H101JC5	CAP C 100PF-J-50V	
C1552	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C1553	ECKR1H103ZF5	CAP C .01UF-Z-50V	
C1554	ECQB1H222JF3	CAP P 2200PF-J-50V	
C1555	ECQB1H103JF3	CAP P .01UF-J-50V	
C1556	ECSF1CE225VB	CAP E 2.2UF-16V	
C1557	ECQV1H224JL3	CAP P .22UF-J-50V	
C1558	ECQB1H104JF3	CAP P .10UF-J-50V	
C1559	ECQB1H333JF3	CAP P .033UF-J-50V	
C1560	ECA1HM100B	CAP E 10UF-50V	
C1561	ECA1HM010B	CAP E 1UF-50V	
C1562	ECQM4223KZW	CAP P .022UF-K-400V	
C1563	ECKW3D152KBR	CAP C 1500PF-K-2KV	
C1564	ECKR3A102KBP	CAP C 1000PF-K-1KV	
C1565	ECQB1H103JF3	CAP P .01UF-J-50V	
C1566	ECQB1H222JF3	CAP P 2200PF-J-50V	
C1567	ECQB1H103JF3	CAP P .01UF-J-50V	
C1568	ECA1HM010B	CAP E 1UF-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C1569	ECQK1562JZ3	CAP P .0056UF-J-100V	
C1570	ECA1HM2R2B	CAP E 2.2UF-50V	
C1571	ECKR2H471KB5	CAP C 470PF-K-500V	
C1572	ECKW3A472KBP	CAP C 4700PF-K-1KV	
C1573	ECQB1H822JF3	CAP P 8200PF-J-50V	
C1574	ECQB1H333JF3	CAP P .033UF-J-50V	
C1575	ECA1CM471B	CAP E 470UF-16V	
C1576	ECA1HM2R2B	CAP E 2.2UF-50V	
C1577	ECKR2H471KB5	CAP C 470PF-K-500V	
C1578	ECQM4223KZW	CAP P .022UF-K-400V	
C1579	ECA1HM100B	CAP E 10UF-50V	
C1580	ECKW3A222KBP	CAP C 2200PF-K-1KV	
C2202	ECA1HM2R2B	CAP E 2.2UF-50V	
C2203	ECA1HM4R7B	CAP E 4.7UF-50V	
C2204	AP106K016CAE	CAP T 1OUF-16V	
C2205	ECA1HM010B	CAP E 1UF-50V	
C2206	ECQB1H223JF3	CAP P .022UF-J-50V	
C2207	AP335K016CAE	CAP T 3.3UF-16V	
C2208	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2209	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2210	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2211	ECA1CM100B	CAP E 10UF-16V	
C2212	ECQB1H473JF3	CAP P .047UF-J-50V	
C2215	ECA0JM101B	CAP E 100UF-6.3V	
C2218	ECA1HMR47B	CAP E .47UF-50V	
C2219	TCJ2VC1H100D	CAP C 10PF-J-50V	
C2302	ECA1HM010B	CAP E 1UF-50V	
C2303	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2304	TCJ2VB1H332K	CAP C .0033UF-K-50V	
C2305	ECA1HM010B	CAP E 1UF-50V	
C2307	ECA1EM102E	CAP E 1000UF-25V	
C2308	ECA1HM101B	CAP E 100UF-50V	
C2311	ECA1HM010B	CAP E 1UF-50V	
C2312	ECA1EM102E	CAP E 1000UF-25V	
C2313	ECA1VM472E	CAP E 4700UF-35V	
C2314	ECA1EM221B	CAP E 220UF-25V	
C2331	ECA1HM010B	CAP E 1UF-50V	
C2332	ECA1HM010B	CAP E 1UF-50V	
C2333	ECA1EM100B	CAP E 10UF-25V	
C2334	ECA1EM100B	CAP E 10UF-25V	
C2335	ECA1HM010B	CAP E 1UF-50V	
C2336	ECA1HM010B	CAP E 1UF-50V	
C2337	ECA1CM470B	CAP E 47UF-16V	
C2431	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2432	ECJ2VF1C105Z	CAP C 1.0UF-Z-16V	
C2433	TCJ2VC1H222J	CAP C 2200PF-J-50V	
C2437	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2438	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C2444	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2445	ECJ2VB1C104K	CAP C .1UF-K-16V	
C2449	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2450	TCJ2VB1H102K	CAP C 1000PF-K-50V	
C2451	ECEA1CN100UB	CAP E 10UF-16V	
C2459	TCJ2VB1H333K	CAP C .033UF-K-50V	

Ref. No.	Part No.	Part Name & Description	Remarks
C2460	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2461	ECA1HM4R7B	CAP E 4.7UF-50V	
C2462	ECA1HM4R7B	CAP E 4.7UF-50V	
C2463	ECEA1CN100UB	CAP E 10UF-16V	
C2464	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2465	TCJ2VB1H333K	CAP C .033UF-K-50V	
C2468	ECA1CM101B	CAP E 100UF-16V	
C2473	ECA1HM4R7B	CAP E 4.7UF-50V	
C2474	ECA1CM101B	CAP E 100UF-16V	
C2475	ECA1HM4R7B	CAP E 4.7UF-50V	
C2801	ECA1EM471E	CAP E 470UF-25V	
C2804	ECA1CM222E	CAP E 2200UF-16V	
C3001	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3002	ECA1AM101B	CAP E 100UF-10V	
C3003	ECA1CM100B	CAP E 10UF-16V	
C3004	ECA1HM010B	CAP E 1UF-50V	
C3006	ECA1HM010B	CAP E 1UF-50V	
C3007	ECA1CM100B	CAP E 10UF-16V	
C3008	ECA1CM100B	CAP E 10UF-16V	
C3009	ECA1HM010B	CAP E 1UF-50V	
C3010	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3011	ECA1HM010B	CAP E 1UF-50V	
C3012	ECA1CM100B	CAP E 10UF-16V	
C3013	ECA1CM100B	CAP E 10UF-16V	
C3014	ECA1HM010B	CAP E 1UF-50V	
C3015	ECA1HM010B	CAP E 1UF-50V	
C3016	ECA1HM010B	CAP E 1UF-50V	
C3018	ECA1CM100B	CAP E 10UF-16V	
C3019	ECA1CM100B	CAP E 10UF-16V	
C3020	ECA1HM010B	CAP E 1UF-50V	
C3021	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3022	ECA1HM010B	CAP E 1UF-50V	
C3023	ECA1CM100B	CAP E 10UF-16V	
C3024	ECA1CM100B	CAP E 10UF-16V	
C3025	TCJ2VB1H103K	CAP C .01UF-K-50V	
C3054	ECA1CM471B	CAP E 470UF-16V	
C3154	ECA1HM010B	CAP E 1UF-50V	
C3155	ECA1HM010B	CAP E 1UF-50V	
C3807	ECA1CM221B	CAP E 10UF-16V	
C3808	ECQV1H224JL3	CAP P .22UF-J-50V	
C3809	ECQM4104KZB	CAP P .10UF-K-400V	
C3811	ECA2EM100B	CAP E 10UF-250V	
C3812	ECEA1CN100UB	CAP E 10UF-16V	
C3814	ECKC3D332KBN	CAP C 3300PF-K-2KV	
C5001	ECA1HM4R7B	CAP E 4.7UF-50V	
C5002	ECA1HM4R7B	CAP E 4.7UF-50V	
C5003	ECQV1H334JL3	CAP P .33UF-J-50V	
C5004	ECQV1H334JL3	CAP P .33UF-J-50V	
C5005	ECA1VM470B	CAP E 47UF-35V	
C5016	ECA1HM100B	CAP E 10UF-50V	
C6501	ECA0JM101B	CAP E 100UF-6.3V	
C6502	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6503	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C6504	ECA1CM470B	CAP E 47UF-16V	

Ref. No.	Part No.	Part Name & Description	Remarks
C6505	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6506	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6507	ECEA1HNR47UB	CAP E .47UF-50V	
C6508	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6509	ECA1CM470B	CAP E 47UF-16V	
C6510	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C6511	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C6512	ECA1CM470B	CAP E 47UF-16V	
C6513	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6514	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6515	ECJ2VF1H104Z	CAP C .1UF-Z-50V	
C6516	ECA1CM470B	CAP E 47UF-16V	
C6517	TCJ2VC1H181J	CAP C 180PF-J-50V	
C6518	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6519	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6520	ECA1CM470B	CAP E 47UF-16V	
C6521	TCJ2VC1H220J	CAP C 22PF-J-50V	
C6522	TCJ2VC1H180J	CAP C 18PF-J-50V	
C6523	TCJ2VC1H120J	CAP C 12PF-J-50V	
C6525	TCJ2VC1H120J	CAP C 12PF-J-50V	
C6526	TCJ2VC1H270J	CAP C 27PF-J-50V	
C6532	TCJ2VB1H103K	CAP C .01UF-K-50V	
C6570	TCJ2VC1H050D	CAP C 5PF-D-50V	
C6571	TCJ2VC1H560J	CAP C 56PF-J-50V	
		DIODES	
D003	MAZ40560MF	DIODE ZENER	
D006	MAZ43000HF	DIODE ZENER	
D007	MAZ40300HF	DIODE ZENER	
D014	MA2C165001VT	DIODE	
D015	MA2C700A0F	DIODE	
D051	MAZ40620MF	DIODE ZENER	
D240	MA2C165001VT	DIODE	
D451	B0EAKM000018	DIODE RECTIFIER	
D455	MA2C165001VT	DIODE	
D456	MA2C165001VT	DIODE	
D457	MA2C165001VT	DIODE	
D459	MA2C165001VT	DIODE	
D504	MAZ43000LF	DIODE ZENER	
D509	MA2C165001VT	DIODE	
D510	MAZ40510MF	DIODE ZENER	
D511	D1NL40V70	DIODE	⚠
D512	D1NL40V70	DIODE	⚠
D551	B0HAMV000018	DIODE	
D552	B0HAMP000059	DIODE	
D553	MA4062LTVTA	DIODE ZENER	⚠
D555	MA2C165001VT	DIODE	
D556	MA2C165001VT	DIODE	
D561	MA2C165001VT	DIODE	
D562	MA2C165001VT	DIODE	
D563	MAZ40620MF	DIODE ZENER	
D753	AU01ZV0	DIODE	
D801	RM10BLFA1	DIODE	⚠
D802	RM10BLFA1	DIODE	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
D803	RM10BLFA1	DIODE	⚠
D804	RM10BLFA1	DIODE	⚠
D805	MA2C700A0F	DIODE	
D806	AU01ZV0	DIODE	
D808	D4DDF1R50001	DIODE	⚠
D814	MA2C17800E	DIODE	
D815	MA2C165001VT	DIODE	
D816	MA2C165001VT	DIODE	
D818	MAZ42000MF	DIODE ZENER	
D820	B0EAKL000008	DIODE RECTIFIER	
D821	B0EAKL000008	DIODE RECTIFIER	
D822	B0EAKL000008	DIODE RECTIFIER	
D823	B0EAKL000008	DIODE RECTIFIER	
D824	B0BA01000046	DIODE ZENER	⚠
D825	B0HANR000003	DIODE	⚠
D826	AU02ZV0	DIODE	
D827	B0HANL000004	DIODE	
D828	B0HANM000016	DIODE	
D829	B0HANM000016	DIODE	
D830	B0HANL000004	DIODE	
D832	MA2C165001VT	DIODE	
D834	AU02ZV0	DIODE	
D835	MA2C165001VT	DIODE	
D836	MAZ41800MF	DIODE ZENER	
D837	MA2C165001VT	DIODE	
D841	MA2C165001VT	DIODE	
D861	B0JAME000052	DIODE	
D862	B0JAME000052	DIODE	
D876	MA2C165001VT	DIODE	
D877	MA2C165001VT	DIODE	
D881	MA2C165001VT	DIODE	
D1001	LN81RPHCF3	DIODE	
D1001	MAZ40680MF	DIODE ZENER	
D1002	MAZ40680MF	DIODE ZENER	
D1003	MAZ40680MF	DIODE ZENER	
D1005	MAZ40680MF	DIODE ZENER	
D1551	B0AAGR000002	DIODE SWITCHING	
D1552	MA2C165001VT	DIODE	
D1553	B0HACW000002	DIODE	
D1557	MA2C165001VT	DIODE	
D1558	MA2C165001VT	DIODE	
D2301	MAZ43600HF	DIODE ZENER	
D2302	MA2C165001VT	DIODE	
D2303	MA2C165001VT	DIODE	
D2305	MAZ41100MF	DIODE ZENER	
D2306	MAZ41100MF	DIODE ZENER	
D2307	MAZ41100MF	DIODE ZENER	
D2308	MAZ41100MF	DIODE ZENER	
D2309	MAZ41100MF	DIODE ZENER	
D2310	MAZ41100MF	DIODE ZENER	
D2311	MAZ41100MF	DIODE ZENER	
D2312	MAZ41100MF	DIODE ZENER	
D2801	B0EAKL000008	DIODE RECTIFIER	

Ref. No.	Part No.	Part Name & Description	Remarks
D2802	B0EAKL000008	DIODE RECTIFIER	
D2803	B0EAKL000008	DIODE RECTIFIER	
D2804	B0EAKL000008	DIODE RECTIFIER	
D3001	MAZ41100MF	DIODE ZENER	
D3002	MAZ41100MF	DIODE ZENER	
D3003	MAZ41100MF	DIODE ZENER	
D3004	MAZ41100MF	DIODE ZENER	
D3005	MAZ41100MF	DIODE ZENER	
D3006	MAZ41100MF	DIODE ZENER	
D3007	MAZ41100MF	DIODE ZENER	
D3008	MAZ41100MF	DIODE ZENER	
D3009	MAZ41100MF	DIODE ZENER	
D3010	MAZ41100MF	DIODE ZENER	
D3011	MAZ41100MF	DIODE ZENER	
D3012	MAZ41100MF	DIODE ZENER	
D3051	MAZ41100MF	DIODE ZENER	
D3151	MAZ41400MF	DIODE ZENER	
D3152	MAZ41400MF	DIODE ZENER	
D3153	MAZ41400MF	DIODE ZENER	
D3154	MAZ41400MF	DIODE ZENER	
D3155	MAZ41400MF	DIODE ZENER	
D3156	MAZ41400MF	DIODE ZENER	
D3157	MAZ40620MF	DIODE ZENER	
D3158	MAZ40750MF	DIODE ZENER	
D3801	MA2C165001VT	DIODE	
D3802	MA2C165001VT	DIODE	
D3803	MA2C165001VT	DIODE	
D3804	MA2C165001VT	DIODE	
D3812	MAZ41500MF	DIODE ZENER	
D3814	B0AAGP000003	DIODE SWITCHING	
D3815	B0AAGP000003	DIODE SWITCHING	
D3816	B0AAGP000003	DIODE SWITCHING	
D3817	MAZ41500MF	DIODE ZENER	
D3818	MAZ41500MF	DIODE ZENER	
D3819	MAZ41500MF	DIODE ZENER	
		FUSES	
F801	XBA2A00101	FUSE 6.3A 125V	⚠
F801-1	K3GD9BB00001	FUSE HOLDER	
F801-2	K3GD9BB00001	FUSE HOLDER	
		INTEGRATED CIRCUITS	
IC001	MN101C46FTK	INT CKT	⚠
IC002	TVR2AJ175S	ADJUSTED EEPROM	
IC005	C0CBABC00037	INT. CKT.	
IC006	PST9128NR	INT CKT	
IC101	TA1310DN	INT CKT	⚠
IC451	C1AA00000521	INT. CKT.	
IC511	AN6914S-E1	INT CKT	
IC750	C0AABB000084	INT. CKT.	
IC801	AN8029	INT CKT	⚠
IC802	C0EAS0000025	INT. CKT.	⚠
IC811	PC123FY2	INT CKT	⚠
IC881	AN7805LB	INT CKT	
IC882	AN7809LB	INT CKT	

Ref. No.	Part No.	Part Name & Description	Remarks
IC883	C0DAZJG00004	INT. CKT.	
IC1001	TC4066BP	INT CKT	
IC1551	AN5422K	INT CKT	
IC2201	AN5849S-E1V	INT CKT	
IC2301	AN5277	INT CKT	
IC2331	C0AABB000084	INT. CKT.	
IC2451	BH3868CFS-E2	INT CKT	
IC2801	AN78M12LB	INT CKT	
IC3001	M52790SP	A/V SWITCH	
IC3801	C1AA00000622	INT. CKT.	
IC5001	PUB4301	INT CKT	
IC5002	AN6564	INT CKT	
IC6501	TC90A49P	INT CKT	
COILS			
L001	EXCELSA35T	FERRITE BEAD	
L002	ELESN180JA	COIL PEAKING 18UH	
L005	ELESN330JA	COIL 33UH	
L006	EXCELSA24T	FERRITE BEAD	
L007	EXCELSA26T	FERRITE BEAD	
L008	EXCELSA39V	EMI BEAD CORE	
L009	EXCELSA26T	FERRITE BEAD	
L012	G0C2R2KA0021	COIL PEAKING 2.2UH	
L013	G0C2R2KA0021	COIL PEAKING 2.2UH	
L106	EXCELSA39V	FERRITE BEAD	
L217	EXCELSA26T	FERRITE BEAD	
L301	G0C470KA0021	COIL PEAKING 47UH	
L302	ELESN120JA	COIL PEAKING 12UH	
L319	G0C101KA0021	COIL PEAKING 100UH	
L519	ELESN101JA	COIL	
L551	ELH5L7722	COIL	⚠
L553	ELHKLB077B	COIL	⚠
L555	EXCELSA35T	FERRITE BEAD	
L556	ELC18B801E	COIL	
L559	TLUADNB682K	COIL	
L601	G0C560KA0021	COIL PEAKING 56UH	
L706	EXCELSA26T	FERRITE BEAD	
L751	ELC18B801E	COIL	
L801	ELF24V037A	COIL	⚠
L802	ELF24V037A	COIL	⚠
L807	G0ZZ00001936	COIL	
L812	EXCELSA26T	FERRITE BEAD	
L814	TALL08T101KA	LINE FILTER	
L815	EXCELSA39E	FERRITE BEAD	
L816	EXCELSA39E	FERRITE BEAD	
L817	EXCELDR35V	FERRITE BEAD	
L818	EXCELDR35V	FERRITE BEAD	
L819	EXCELSA24T	FERRITE BEAD	
L820	EXCELSA24T	FERRITE BEAD	
L821	EXCELDR35V	FERRITE BEAD	
L824	EXCELDR35V	FERRITE BEAD	
L825	TLUADTB121K	COIL	
L826	TLUADTB820K	COIL	
L827	TALL08T470KA	COIL	

Ref. No.	Part No.	Part Name & Description	Remarks
L850	ELESN101JA	COIL	
L851	TLUADTB121K	COIL	
L951	EXCELSA24T	FERRITE BEAD	
L953	EXCELSA24T	FERRITE BEAD	
L954	EXCELSA24T	FERRITE BEAD	
L955	EXCELSA24T	FERRITE BEAD	
L1551	TALL13T103JB	LINE FILTER	
L3001	EXCELSA35T	FERRITE BEAD	
L3804	EXCELDR35V	FERRITE BEAD	
L5001	EXCELSA35T	FERRITE BEAD	
L5002	EXCELDR35V	FERRITE BEAD	
L6502	ELESN150JA	COIL PEAKING 15UH	
L6503	ELESN330JA	COIL 33UH	
L6504	ELESN100JA	COIL PEAKING 10UH	
L6507	ELESN150JA	COIL PEAKING 15UH	
TRANSISTORS			
Q002	2SC1685QRSTA	TRANSISTOR	
Q009	2SD601ARTX	TRANSISTOR	
Q201	2SD601ARTX	TRANSISTOR	
Q303	2SD601ARTX	TRANSISTOR	
Q402	2SD601ARTX	TRANSISTOR	
Q453	2SD601ARTX	TRANSISTOR	
Q480	2SA1309ATA	TRANSISTOR	
Q501	2SC3941RTA	TRANSISTOR	
Q515	2SD601ARTX	TRANSISTOR	
Q551	2SC5517000LK	TRANSISTOR	
Q552	2SC1685QRSTA	TRANSISTOR	
Q553	2SC1685QRSTA	TRANSISTOR	
Q563	2SC3941RTA	TRANSISTOR	
Q603	2SD601ARTX	TRANSISTOR	
Q611	2SB709ARTX	TRANSISTOR	
Q701	2SD601ARTX	TRANSISTOR	
Q702	2SA1309ATA	TRANSISTOR	
Q751	B1DACM000001	TRANSISTOR	
Q754	2SC1685QRSTA	TRANSISTOR	
Q801	2SK2917LB	TRANSISTOR	
Q802	2SC1685QRSTA	TRANSISTOR	
Q803	2SC1685QRSTA	TRANSISTOR	
Q804	2SA564AQRSTA	TRANSISTOR	
Q854	2SA19610QAHW	TRANSISTOR	
Q881	2SC1685QRSTA	TRANSISTOR	
Q882	2SB709ARTX	TRANSISTOR	
Q883	2SB709ARTX	TRANSISTOR	
Q901	2SD601ARTX	TRANSISTOR	
Q951	2SC1685QRSTA	TRANSISTOR	
Q952	2SC1685QRSTA	TRANSISTOR	
Q953	2SC1741ASTP	TRANSISTOR	
Q954	2SB1030ATA	TRANSISTOR	
Q955	2SB1569AF51E	TRANSISTOR	
Q956	2SD2400AF51E	TRANSISTOR	
Q957	2SA564AQRSTA	TRANSISTOR	
Q958	2SC1685QRSTA	TRANSISTOR	
Q961	2SC1685QRSTA	TRANSISTOR	
Q962	2SC1685QRSTA	TRANSISTOR	

Ref. No.	Part No.	Part Name & Description	Remarks
Q1001	2SC1685QRSTA	TRANSISTOR	
Q1002	2SC1685QRSTA	TRANSISTOR	
Q1003	2SC1685QRSTA	TRANSISTOR	
Q1004	2SC1685QRSTA	TRANSISTOR	
Q1005	2SC1685QRSTA	TRANSISTOR	
Q1006	2SC1685QRSTA	TRANSISTOR	
Q1007	2SC1685QRSTA	TRANSISTOR	
Q1008	2SC1685QRSTA	TRANSISTOR	
Q1009	2SC1685QRSTA	TRANSISTOR	
Q1010	2SC1685QRSTA	TRANSISTOR	
Q1011	2SC1685QRSTA	TRANSISTOR	
Q1051	2SC1685QRSTA	TRANSISTOR	
Q1551	B1BAAP000005	TRANSISTOR	
Q1552	2SC1685QRSTA	TRANSISTOR	
Q1553	2SC1685QRSTA	TRANSISTOR	
Q1554	2SC1685QRSTA	TRANSISTOR	
Q1555	B1BAAT000001	TRANSISTOR	
Q2302	2SD601ARTX	TRANSISTOR	
Q2331	2SD601ARTX	TRANSISTOR	
Q2332	2SB709ARTX	TRANSISTOR	
Q2333	2SD601ARTX	TRANSISTOR	
Q2334	2SD601ARTX	TRANSISTOR	
Q2335	2SB709ARTX	TRANSISTOR	
Q2336	2SD601ARTX	TRANSISTOR	
Q3050	2SD601ARTX	TRANSISTOR	
Q3802	2SA564AQRSTA	TRANSISTOR	
Q6501	2SD601ARTX	TRANSISTOR	
Q6502	2SB709ARTX	TRANSISTOR	
Q6510	2SB709ARTX	TRANSISTOR	
Q6511	2SD601ARTX	TRANSISTOR	
Q6512	2SD601ARTX	TRANSISTOR	
Q6519	2SD601ARTX	TRANSISTOR	
RELAYS			
RL801	TSEH8007	RELAY	⚠
RL802	TSE10814	RELAY	⚠
RESISTORS			
R002	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R003	ERJ6GEYJ182V	RES M 1.8K-J-1/10W	
R004	ERDS1TJ122T	RES C 1.2K-J-1/2W	
R005	ERDS2TJ680T	RES C 68-J-1/4W	
R006	ERJ6ENF1372V	RES M 13.7K-F-1/10W	
R007	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R008	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R009	ERJ6GEYJ221V	RES M 220-J-1/10W	
R010	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R011	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R012	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R013	ERJ6ENF1002V	RES M 10K-F-1/10W	
R014	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R015	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R016	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R017	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R020	ERJ6GEYJ682V	RES M 6.8K-J-1/10W	
R021	ERJ6GEYJ101V	RES M 100-J-1/10W	

R021	ERJ3GEYJ101V	RES M 100 J 1/16W	

Ref. No.	Part No.	Part Name & Description	Remarks
R022	ERJ6GEYJ101V	RES M 100-J-1/10W	
R023	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R024	ERJ6ENF2322V	RES M 23.2K-F-1/10W	
R025	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R026	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R027	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R028	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R029	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R030	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R033	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R034	ERJ6GEYJ563V	RES M 56K-J-1/10W	
R040	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R041	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R042	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R043	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R044	ERJ6GEYJ273V	RES M 27K-J-1/10W	
R046	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R048	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R049	ERJ6GEYJ101V	RES M 100-J-1/10W	
R050	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R051	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R058	ERJ6GEYJ101V	RES M 100-J-1/10W	
R058	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R059	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R060	ERJ6GEYJ471V	RES M 470-J-1/10W	
R061	ERJ6GEYJ471V	RES M 470-J-1/10W	
R066	ERJ6GEYJ752V	RES M 7.5K-J-1/10W	
R067	ERJ6GEYJ752V	RES M 7.5K-J-1/10W	
R068	ERJ6GEYJ752V	RES M 7.5K-J-1/10W	
R072	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R073	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R074	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R075	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R076	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R077	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R078	ERJ6GEYJ101V	RES M 100-J-1/10W	
R079	ERJ6GEYJ101V	RES M 100-J-1/10W	
R082	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R083	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R086	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R087	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R088	ERDS2TJ103T	RES C 10K-J-1/4W	
R104	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R122	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R201	ERJ6GEYJ331V	RES M 330-J-1/10W	
R223	ERJ6GEYJ561V	RES M 560-J-1/10W	
R225	ERDS2TJ331T	RES C 330-J-1/4W	
R226	ERDS2TJ331T	RES C 330-J-1/4W	
R245	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R246	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R301	ERJ6GEYJ101V	RES M 100-J-1/10W	
R302	ERJ6GEYJ101V	RES M 100-J-1/10W	
R303	ERJ6GEYJ101V	RES M 100-J-1/10W	
R306	ERJ6GEYJ103V	RES M 10K-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R310	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R328	ERDS2TJ105T	RES C 1M-J-1/4W	
R329	ERJ6GEYJ304V	RES M 300K-J-1/10W	
R341	ERJ6GEYJ474V	RES M 470K-J-1/10W	
R401	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R402	ERJ6GEYJ471V	RES M 470-J-1/10W	
R403	ERJ6GEYJ622V	RES M 6.2K-J-1/10W	
R404	ERJ6GEYJ101V	RES M 100-J-1/10W	
R405	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R409	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R410	ERJ6ENF2492V	RES M 24.9K-F-1/10W	
R412	ERJ6ENF1103V	RES M 110K-F-1/10W	
R450	ERJ6GEYJ821V	RES M 820-J-1/10W	
R451	ERG2FJ221H	RES M 220-J-2W	
R452	ERDS1FJ6R8T	RES C 6.8-J-1/2W	
R453	ER0S2THF1202	RES M 12K-F-1/4W	
R454	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R455	ERDS2TJ512T	RES C 5.1K-J-1/4W	
R456	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R457	ERDS2TJ112T	RES C 1.1K-J-1/4W	
R458	ERDS2TJ562T	RES C 5.6K-J-1/4W	
R459	ERX1SJ1R2P	RES M 1.2-J-1W	
R460	ER0S2THF1002	RES M 10K-F-1/4W	
R461	ER0S2THF1601	RES M 1.6K-F-1/4W	
R465	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R468	ERJ6GEYJ104V	RES M 100K-J-1/10W	
R469	ERJ6GEYJ101V	RES M 100-J-1/10W	
R470	ERJ6GEYJ562V	RES M 5.6K-J-1/10W	
R471	ERJ6GEYJ224V	RES M 220K-J-1/10W	
R472	ERJ6GEYJ123V	RES M 12K-J-1/10W	
R476	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R480	ERDS2TJ392T	RES C 3.9K-J-1/4W	
R481	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R482	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R485	ERJ6GEYJ152V	RES M 1.5K-J-1/10W	
R486	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R487	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R489	ER0S2THF1202	RES M 12K-F-1/4W	
R490	ER0S2THF5101	RES M 5.1K-F-1/4W	
R491	ER0S2THF1052	RES M 10.5K-F-1/4W	
R501	ERDS2TJ561T	RES C 560-J-1/4W	
R502	ERDS2TJ561T	RES C 560-J-1/4W	
R503	ERG3FJ332H	RES M 3.3K-J-3W	
R504	ERJ6GEYJ333V	RES M 33K-J-1/10W	
R505	ERDS1TJ561T	RES C 560-J-1/2W	
R510	ERG2FJ122H	RES M 1.2K-J-2W	
R512	ERG3FJ222H	RES M 2200-J-3W	
R513	ERG3FJ222H	RES M 2200-J-3W	
R514	ER0S2THF3482	RES M 34.8K-F-1/4W	
R515	ER0S2THF3742	RES M 37.4K-F-1/4W	
R516	ERDS2TJ101T	RES C 100-J-1/4W	
R517	ERG1SJ103P	RES M 10K-J-1W	
R518	ERDS1FJ1R5T	RES C 1.5-J-1/2W	⚠
R519	ERQ1CJ1R5	RES F 1.5-J-1W	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
R520	ERQ14AJ2R2E	RES F 2.2-J-1/4W	⚠
R521	ER0S2THF8201	RES M 8.2K-F-1/4W	⚠
R522	ER0S2THF2611	RES M 2.61K-F-1/4W	⚠
R527	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R528	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R529	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R542	ERJ6GEYJ272V	RES M 2.7K-J-1/10W	
R555	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R556	ERDS2TJ103T	RES C 10K-J-1/4W	
R557	ERDS2TJ103T	RES C 10K-J-1/4W	
R558	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R559	ERDS2TJ102T	RES C 1K-J-1/4W	
R561	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R562	ERDS2TJ473T	RES C 47K-J-1/4W	
R576	ERQ12AJ101P	RES F 100-J-1/2W	
R590	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R591	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R592	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R596	ERDS2TJ102T	RES C 1K-J-1/4W	
R601	ERJ6GEYJ391V	RES M 390-J-1/10W	
R606	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R613	ERJ6GEYJ471V	RES M 470-J-1/10W	
R614	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R618	ERJ6GEYJ474V	RES M 470K-J-1/10W	
R619	ERJ6GEYJ563V	RES M 56K-J-1/10W	
R620	ERJ6GEYJ153V	RES M 15K-J-1/10W	
R701	ERJ6GEYJ122V	RES M 1.2K-J-1/10W	
R702	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R704	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R705	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R706	ERDS2TJ394T	RES C 390K-J-1/4W	
R707	ERDS2TJ393T	RES C 39K-J-1/4W	
R708	ERDS2TJ101T	RES C 100-J-1/4W	
R709	ERDS2TJ103T	RES C 10K-J-1/4W	
R710	ERDS2TJ103T	RES C 10K-J-1/4W	
R711	ERDS2TJ183T	RES C 18K-J-1/4W	
R712	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R713	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R714	ERDS1FJ102T	RES C 1K-J-1/2W	
R716	ERDS2TJ101T	RES C 100-J-1/4W	
R717	ERDS2TJ101T	RES C 100-J-1/4W	
R719	ERDS2TJ331T	RES C 330-J-1/4W	
R720	ERDS2TJ103T	RES C 10K-J-1/4W	
R752	ERDS2TJ103T	RES C 10K-J-1/4W	
R753	ERDS1FJ102T	RES C 1K-J-1/2W	
R754	ERDS1TJ751T	RES C 750-J-1/2W	
R756	ERG2FJ820H	RES M 82-J-2W	
R801	ERF7ZK1R0	RES W 1.0-K-7W	⚠
R802	ERC14GK824D	RES C 820K-K-1/4W	
R807	ERDS2TJ820T	RES C 82-J-1/4W	
R808	ERDS2TJ680T	RES C 68-J-1/4W	
R809	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R810	ERDS2TJ473T	RES C 47K-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R811	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R812	ERDS2TJ473T	RES C 47K-J-1/4W	
R813	ERDS1FJ122T	RES C 12K-J-1/2W	
R814	ERG3FJ103H	RES M 10K-J-3W	
R815	ERDS2TJ331T	RES C 330-J-1/4W	
R816	ERDS2TJ471T	RES C 470-J-1/4W	
R817	ER0S2THF1371	RES M 1.37K-F-1/4W	
R818	ERDS2TJ220T	RES C 22-J-1/4W	
R819	ERDS1FJ390T	RES C 39-J-1/2W	
R820	ERDS1FJ120T	RES C 12-J-1/2W	
R821	ERX12SJ1R0P	RES M 1.0-J-1/2W	
R822	ERX12SJ1R0P	RES M 1.0-J-1/2W	
R823	ERDS2TJ102T	RES C 1K-J-1/4W	
R824	ERDS2TJ153T	RES C 15K-J-1/4W	
R825	ERDS2TJ104T	RES C 100K-J-1/4W	
R826	ERDS2TJ103T	RES C 10K-J-1/4W	
R828	ERDS2TJ103T	RES C 10K-J-1/4W	
R829	ERDS2TJ103T	RES C 10K-J-1/4W	
R830	ERDS2TJ103T	RES C 10K-J-1/4W	
R832	ERD75TAJ825	RES C 8.2MEG-J-3/4W	⚠
R835	ERDS2TJ101T	RES C 100-J-1/4W	
R836	ERG1SJ273P	RES M 27K-J-1W	
R837	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R839	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R840	ERDS2TJ470T	RES C 47-J-1/4W	
R846	ERDS1FJ473T	RES C 47K-J-1/2W	
R847	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R850	ERX3FJ2R7	RES M 2.7-J-3W	
R852	ERDS1FJ391T	RES C 390-J-1/2W	
R855	ERDS2TJ913T	RES C 91K-J-1/4W	
R856	ERDS2TJ123T	RES C 12K-J-1/4W	
R857	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R858	ERDS1FJ1R0T	RES C 1.0-J-1/2W	
R859	ERDS2TJ103T	RES C 10K-J-1/4W	
R860	ERDS1FJ102T	RES C 1K-J-1/2W	
R861	ERX12SJR22P	RES M .22-J-1/2W	⚠
R862	ERX12SJR22P	RES M .22-J-1/2W	⚠
R863	ERX12SJR22P	RES M .22-J-1/2W	⚠
R881	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R882	ERJ6GEYJ271V	RES M 270-J-1/10W	
R883	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R884	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R885	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R886	ERDS2TJ181T	RES C 180-J-1/4W	
R901	ERJ6GEYJ331V	RES M 330-J-1/10W	
R902	ERJ6GEYJ391V	RES M 390-J-1/10W	
R903	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R951	ERDS2TJ821T	RES C 820-J-1/4W	
R952	ERDS2TJ223T	RES C 22K-J-1/4W	
R953	ERDS2TJ332T	RES C 3.3K-J-1/4W	
R954	ERDS2TJ431T	RES C 430-J-1/4W	
R956	ERDS2TJ510T	RES C 51-J-1/4W	
R958	ERDS2TJ391T	RES C 390-J-1/4W	

Ref. No.	Part No.	Part Name & Description	Remarks
R959	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R960	**ERQ14AJ100P**	**RES F 10-J-1/4W**	
R961	**ERQ1CJP331S**	**RES F 330-J-1W**	
R962	**ERDS2TJ330T**	**RES C 33-J-1/4W**	
R963	**ERDS2TJ330T**	**RES C 33-J-1/4W**	
R964	**ERDS2TJ471T**	**RES C 470-J-1/4W**	
R965	**ERDS2TJ563T**	**RES C 56K-J-1/4W**	
R966	**ERDS1FJ471P**	**RES C 470-J-1/2W**	
R967	**ERDS2TJ563T**	**RES C 56K-J-1/4W**	
R968	**ERDS2TJ471T**	**RES C 470-J-1/4W**	
R969	**ERDS2TJ390T**	**RES C 39-J-1/2W**	
R970	**ERDS2TJ2R7T**	**RES C 2.7-J-1/4W**	
R971	**ERDS2TJ2R7T**	**RES C 2.7-J-1/4W**	
R972	**ERDS2TJ390T**	**RES C 39-J-1/2W**	
R973	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R974	**ERDS2TJ333T**	**RES C 33K-J-1/4W**	
R975	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R976	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R977	**ERDS2TJ561T**	**RES C 560-J-1/4W**	
R978	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R987	**ERDS2TJ821T**	**RES C 820-J-1/4W**	
R988	**ERDS2TJ331T**	**RES C 330-J-1/4W**	
R989	**ERDS2TJ682T**	**RES C 6.8K-J-1/4W**	
R990	**ERDS2TJ471T**	**RES C 470-J-1/4W**	
R993	**ERDS2TJ471T**	**RES C 470-J-1/4W**	
R1010	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1011	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1012	**ERDS2TJ104T**	**RES C 100K-J-1/4W**	
R1013	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1014	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1015	**ERDS2TJ105T**	**RES C 1M-J-1/4W**	
R1018	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R1019	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R1020	**ERDS2TJ561T**	**RES C 560-J-1/4W**	
R1021	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1022	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R1023	**ERDS2TJ101T**	**RES C 100-J-1/4W**	
R1028	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1033	**ERDS2TJ104T**	**RES C 100K-J-1/4W**	
R1034	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1035	**ERDS2TJ103T**	**RES C 10K-J-1/4W**	
R1036	**ERDS2TJ682T**	**RES C 6.8K-J-1/4W**	
R1037	**ERDS2TJ105T**	**RES C 1M-J-1/4W**	
R1040	**ERDS2TJ223T**	**RES C 22K-J-1/4W**	
R1041	**ERDS2TJ562T**	**RES C 5.6K-J-1/4W**	
R1042	**ERDS2TJ102T**	**RES C 1K-J-1/4W**	
R1043	**ERDS2TJ223T**	**RES C 22K-J-1/4W**	
R1044	**ERDS2TJ562T**	**RES C 5.6K-J-1/4W**	
R1045	**ERDS2TJ223T**	**RES C 22K-J-1/4W**	
R1046	**ERDS2TJ562T**	**RES C 5.6K-J-1/4W**	
R1047	**ERDS2TJ102T**	**RES C 1K-J-1/4W**	
R1048	**ERDS2TJ223T**	**RES C 22K-J-1/4W**	
R1049	**ERDS2TJ562T**	**RES C 5.6K-J-1/4W**	
R1051	**ER0S2THF1002**	**RES M 10K-F-1/4W**	

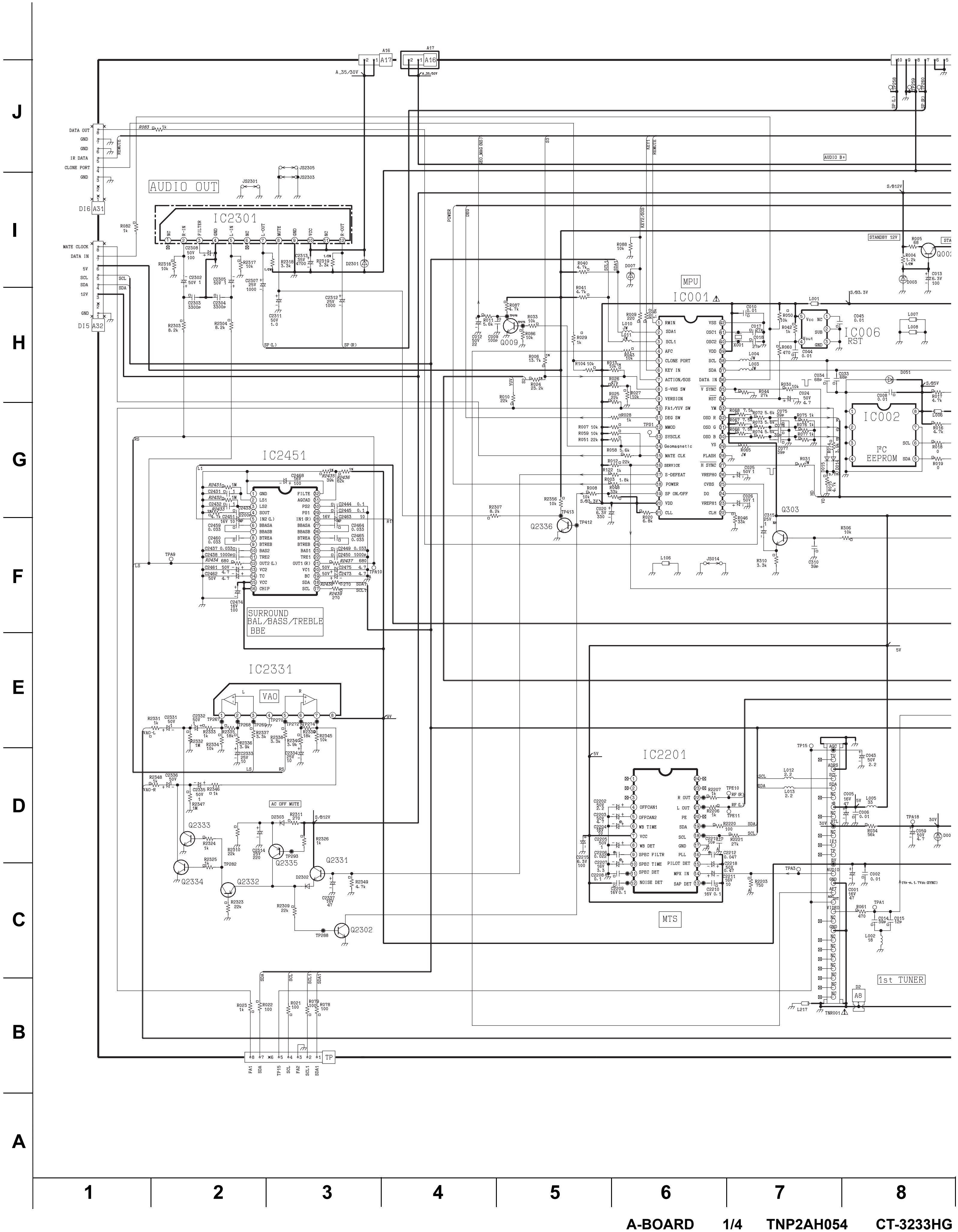
Ref. No.	Part No.	Part Name & Description	Remarks
R1052	ER0S2THF2611	RES M 2.61K-F-1/4W	
R1053	ER0S2THF2321	RES M 2.32K-F-1/4W	
R1054	ER0S2THF3481	RES M 3.48K-F-1/4W	
R1055	ER0S2THF5231	RES M 5.23K-F-1/4W	
R1056	ER0S2THF9761	RES M 9.76K-F-1/4W	
R1057	ER0S2THF2372	RES M 23.7K-F-1/4W	
R1058	ERDS2TJ103T	RES C 10K-J-1/4W	
R1059	ERDS2TJ102T	RES C 1K-J-1/4W	
R1062	ERDS2TJ182T	RES C 1.8K-J-1/4W	
R1063	ERDS2TJ470T	RES C 47-J-1/4W	
R1064	ERDS2TJ394T	RES C 390K-J-1/4W	
R1066	ERDS2TJ473T	RES C 47K-J-1/4W	
R1513	ERDS2TJ753T	RES C 75K-J-1/4W	
R1550	ERDS2TJ221T	RES C 220-J-1/4W	
R1554	ERDS2TJ103T	RES C 10K-J-1/4W	
R1555	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R1556	ER0S2THF1802	RES M 18K-F-1/4W	
R1558	ERDS2TJ473T	RES C 47K-J-1/4W	
R1559	ERDS2TJ561T	RES C 560-J-1/4W	
R1560	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R1561	ERDS2TJ564T	RES C 560K-J-1/4W	
R1562	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R1563	ER0S2THF9102	RES M 91K-F-1/4W	
R1564	ER0S2THF6041	RES M 6.04K-F-1/4W	
R1565	ERDS2TJ104T	RES C 100K-J-1/4W	
R1566	ERDS2TJ104T	RES C 100K-J-1/4W	
R1567	ERDS2TJ104T	RES C 100K-J-1/4W	
R1568	ERDS2TJ104T	RES C 100K-J-1/4W	
R1570	ERC12GK104D	RES C 100K-K-1/2W	
R1571	ERG3FJ821H	RES M 820-J-3W	
R1572	ERDS2TJ334T	RES C 330K-J-1/4W	
R1573	ERDS2TJ473T	RES C 47K-J-1/4W	
R1575	ERDS2TJ683T	RES C 68K-J-1/4W	
R1576	ERDS2TJ101T	RES C 100-J-1/4W	
R1577	EVMEGSA00B54	RESISTOR VARIABLE	
R1578	ERDS2TJ822T	RES C 8.2K-J-1/4W	
R1579	ERDS2TJ153T	RES C 15K-J-1/4W	
R1580	ERDS2TJ563T	RES C 56K-J-1/4W	
R1581	EVMEGSA00B53	RESISTOR VARIABLE	
R1582	ERDS2TJ752T	RES C 7.5K-J-1/4W	
R1583	ERDS2TJ223T	RES C 22K-J-1/4W	
R1584	ERDS2TJ222T	RES C 2.2K-J-1/4W	
R1585	ERDS2TJ102T	RES C 1K-J-1/4W	
R1586	ERDS1TJ681T	RES C 680-J-1/2W	
R1587	ERDS2TJ101T	RES C 100-J-1/4W	
R1588	ERG2FJ472H	RES M 4.7K-J-2W	
R1589	ERG3FJ821H	RES M 820-J-3W	
R1590	ERDS2TJ223T	RES C 22K-J-1/4W	
R1591	ERG3FJ821H	RES M 820-J-3W	
R1592	ERDS2TJ684T	RES C 680K-J-1/4W	
R1593	ERDS2TJ125T	RES C 1.2M-J-1/4W	
R1594	ERDS2TJ125T	RES C 1.2M-J-1/4W	
R1595	ERDS2TJ102T	RES C 1K-J-1/4W	
R2203	ERJ6GEYJ751V	RES M 750-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R2206	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2207	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2220	ERJ6GEYJ101V	RES M 100-J-1/10W	
R2221	ERJ6GEYJ273V	RES M 27K-J-1/10W	
R2303	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R2304	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R2307	ERJ6GEYJ822V	RES M 8.2K-J-1/10W	
R2309	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2310	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2311	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2316	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2317	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2318	ERDS1TJ332T	RES C 3.3K-J-1/2W	
R2319	ERDS1TJ332T	RES C 3.3K-J-1/2W	
R2323	ERJ6GEYJ223V	RES M 22K-J-1/10W	
R2324	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2325	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2326	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2331	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2332	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2333	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2334	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2335	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2336	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R2337	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2338	ERJ6GEYJ332V	RES M 3.3K-J-1/10W	
R2339	ERJ6GEYJ183V	RES M 18K-J-1/10W	
R2340	ERJ6GEYJ392V	RES M 3.9K-J-1/10W	
R2345	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2346	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2347	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2348	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R2349	ERJ6GEYJ472V	RES M 4.7K-J-1/10W	
R2352	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2356	ERJ6GEYJ103V	RES M 10K-J-1/10W	
R2366	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2367	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
R2385	ERG1SJ151P	RES M 150-J-1W	
R2386	ERG1SJ151P	RES M 150-J-1W	
R2431	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2432	ERJ6GEYJ105V	RES M 1M-J-1/10W	
R2433	ERJ6ENF4701V	RES M 4.7K-F-1/10W	
R2434	ERJ6GEYJ681V	RES M 680-J-1/10W	
R2435	ERJ6ENF3902V	RES M 39K-F-1/10W	
R2436	ERJ6ENF6202V	RES M 62K-F-1/10W	
R2437	ERJ6GEYJ681V	RES M 680-J-1/10W	
R2438	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2439	ERJ6GEYJ271V	RES M 270-J-1/10W	
R2801	ERQ1CKPR33S	RES F .33-K-1W	
R3001	ERJ6GEYJ101V	RES M 100-J-1/10W	
R3003	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3004	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3005	ERJ6ENF75R0V	RES M 75.0-F-1/10W	
R3013	ERJ6GEYJ330V	RES M 33-J-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R3014	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3015	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3016	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3017	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3018	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3019	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3020	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3021	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3022	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3023	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3024	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R3025	ERJ6GEYJ330V	RES M 33-J-1/10W	
R3060	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3061	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3065	ERJ6GEYJ680V	RES M 68-J-1/10W	
R3069	ERJ6GEYJ471V	RES M 470-J-1/10W	
R3152	ERDS2TJ224T	RES C 220K-J-1/4W	
R3154	ERDS2TJ224T	RES C 220K-J-1/4W	
R3801	ERDS2TJ471T	RES C 470-J-1/4W	
R3802	ERDS2TJ471T	RES C 470-J-1/4W	
R3803	ERDS2TJ471T	RES C 470-J-1/4W	
R3804	ER0S2THF9100	RES M 910-F-1/4W	
R3805	ER0S2THF9100	RES M 910-F-1/4W	
R3806	ER0S2THF9100	RES M 910-F-1/4W	
R3808	ER0S2THF1001	RES M 1K-F-1/4W	
R3810	ER0S2THF1001	RES M 1K-F-1/4W	
R3811	ER0S2THF1001	RES M 1K-F-1/4W	
R3814	ER0S2THF8451	RES M 8.45K-F-1/4W	
R3815	ERG1SJ104P	RES M 100K-J-1W	
R3816	ERDS2TJ103T	RES C 10K-J-1/4W	
R3817	ERG1SJ104P	RES M 100K-J-1W	
R3818	ERG1SJ104P	RES M 100K-J-1W	
R3819	ER0S2THF1601	RES M 1.6K-F-1/4W	
R3823	ERQ12AJ121P	RES F 120-J-1/2W	
R3824	ERC12GK222V	RES C 2200-K-1/2W	
R3825	ERC12GK222V	RES C 2200-K-1/2W	
R3826	ERC12GK222V	RES C 2200-K-1/2W	
R5001	ERDS2TJ472T	RES C 4.7K-J-1/4W	
R5003	ERX12SJ2R7P	RES M 2.7-J-1/2W	
R5004	ERDS2TJ272T	RES C 2.7K-J-1/4W	
R5005	ER0S2THF1331	RES M 13.3K-F-1/4W	
R5006	ER0S2THF3320	RES M 332-F-1/4W	
R5007	ER0S2THF1001	RES M 1K-F-1/4W	
R5008	ER0S2THF3832	RES M 38.3K-F-1/4W	
R5009	ER0S2THF9091	RES M 90.9K-F-1/4W	
R5010	ER0S2THF2213	RES M 221K-F-1/4W	
R5011	ER0S2THF5491	RES M 54.9K-F-1/4W	
R5012	ER0S2THF2701	RES M 2.7K-F-1/4W	
R5014	ERDS2TJ271T	RES C 270-J-1/4W	
R6501	ERJ6GEYJ273V	RES M 27K-J-1/10W	
R6502	ERJ6GEYJ473V	RES M 47K-J-1/10W	
R6503	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6504	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6505	ERJ6ENF1301V	RES M 1.3K-F-1/10W	

Ref. No.	Part No.	Part Name & Description	Remarks
R6506	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6507	ERJ6GEYJ221V	RES M 220-J-1/10W	
R6509	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6510	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6512	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6517	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6520	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6522	ERJ6GEYJ561V	RES M 560-J-1/10W	
R6524	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6538	ERJ6GEYJ821V	RES M 820-J-1/10W	
R6548	ERJ6GEYJ471V	RES M 470-J-1/10W	
R6565	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6566	ERJ6GEYJ102V	RES M 1K-J-1/10W	
R6567	ERJ6GEYJ222V	RES M 2.2K-J-1/10W	
		SWITCHES	
S001	EVQPF106K	SWITCH	
S002	EVQPBD05R	SWITCH	
S003	EVQPBD05R	SWITCH	
S004	EVQPBD05R	SWITCH	
S005	EVQPBD05R	SWITCH	
S006	EVQPBD05R	SWITCH	
S007	EVQPBD05R	SWITCH	
		TRANSFORMERS	
T501	ETH19Y70AY	TRANSFORMER	
T551	KFT6AA424F	TRANSFORMER FLYBACK	⚠
T801	ETS44KA165AG	TRANSFORMER POWER SUPPLY	⚠
T802	TLP16297	TRANSFORMER STANDBY	⚠
T1551	ETF18L39B	TRANSFORMER DAF	⚠
T2801	TLP2AA002	TRANSFORMER POWER	⚠
		CRYSTALS / FILTERS	
X001	TSSA092	CRYSTAL OSCILLATOR	
X501	TSS2AA001	CRYSTAL 3.58MHZ	
X601	H2A503300008	CERAMIC OSCILLATOR	
		OTHERS	
TNR001	ENG36604GR	TUNER	⚠
1	M80LSW095X	CRT 32”	⚠
JK3804	K3B10CA00041	CRT SOCKET	⚠
2	TLY2AA023	DEFLECTION YOKE	⚠
M001	TXFYA010EEW	DAG GROUND	
3	TSP2AF009	COIL GEOMAGNETIC	⚠
4	TSP2AA016	COIL DEGAUSSING	
5	TSP2AF007	COIL ROTATION	⚠
6	TAS2AA0024	SPEAKER 8-OHM	
M002	TXFKP24GSER	SPEAKER BRAKET	
7	TKP2AA0406S	FRONT DOOR	
8	TEK6940	DOOR CATCH	
M003	TBX2AA2201	POWER BUTTON	
9	TKP2AA0391	IR GUIDE	
M004	TSN63115-4	PURITY MAGNET	
M005	0FMK014ZZ	CONVERGENCE STRIP	
10	TBM2AA0024	BADGE PANASONIC	
M006	TSX2AA0211-1	A.C. LINE CORD	⚠

Ref. No.	Part No.	Part Name & Description	Remarks
11	TXFKY09GSER	FRONT CABINET (WITH KEYBOARD MOLDED)	
12	TXFKP09GSER	FRONT PANELS	
13	TXFKU03GSER	BACK CABINET	
JK1001	TJB2AX0021	MODULAR JACK	
JK1002	TJB2AX0051	POWER OUTLET JACK (ULIM)	
JK3001	TJB2AA0361	TERMINAL REAR A/V	
JK3151	TJBA187	A/V OUTPUT JACK	
JK3804	K3B10CA00041	CONNECTOR	
		ACCESORIES	
M007	TQB2AA0476	OWNERS MANUAL	



AUDIO OUT
IC2301
IC2451
SURROUND
BAL/BASS/TREBLE
BBE
IC2331
VAO
AC OFF MUTE
MPU
IC001
IC006
RST
IC002
I²C
EEPROM
IC2201
MTS
1st TUNER
STANDBY 12V
AUDIO B+
DATA OUT
GND
IR DATA
CLONE PORT
MATE CLOCK
DATA IN
5V
SCL
SDA
12V
D16
A31
D15
A32
A16
A17
TP
Q009
Q2336
Q303
Q2333
Q2334
Q2332
Q2335
Q2331
Q2302
TNR001
S/B12V
S/B3.3V
S/B5V
30V
RMIN
SDA1
SCL1
AFC
CLONE PORT
KEY IN
ACTION/SOS
S-VHS SW
VERSION
FA1/YUV SW
DEG SW
MMOD
SYSCLK
Geomagnetic
MATE CLK
SERVICE
S-DEFEAT
POWER
SP ON/OFF
VDD
CLL
VSS
OSC1
OSC2
VDD
SCL
SDA
DATA IN
V SYNC
RST
YM
OSD R
OSD G
OSD B
YS
FLASH
H SYNC
VREPH0
CVBS
DO
VREPH1
CLH
OFFCAN1
OFFCAN2
WB TIME
VCC
WB DET
SPEC FILTR
SPEC TIME
SPEC DET
NOISE DET
R OUT
L OUT
PE
PLL
PILOT DET
MPX IN
SAP DET
AGC
TU
ADRS
AUDIO
VIDEO
FA1
SDA
TP15
FA2
SCL1
SDA1
J
I
H
G
F
E
D
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A
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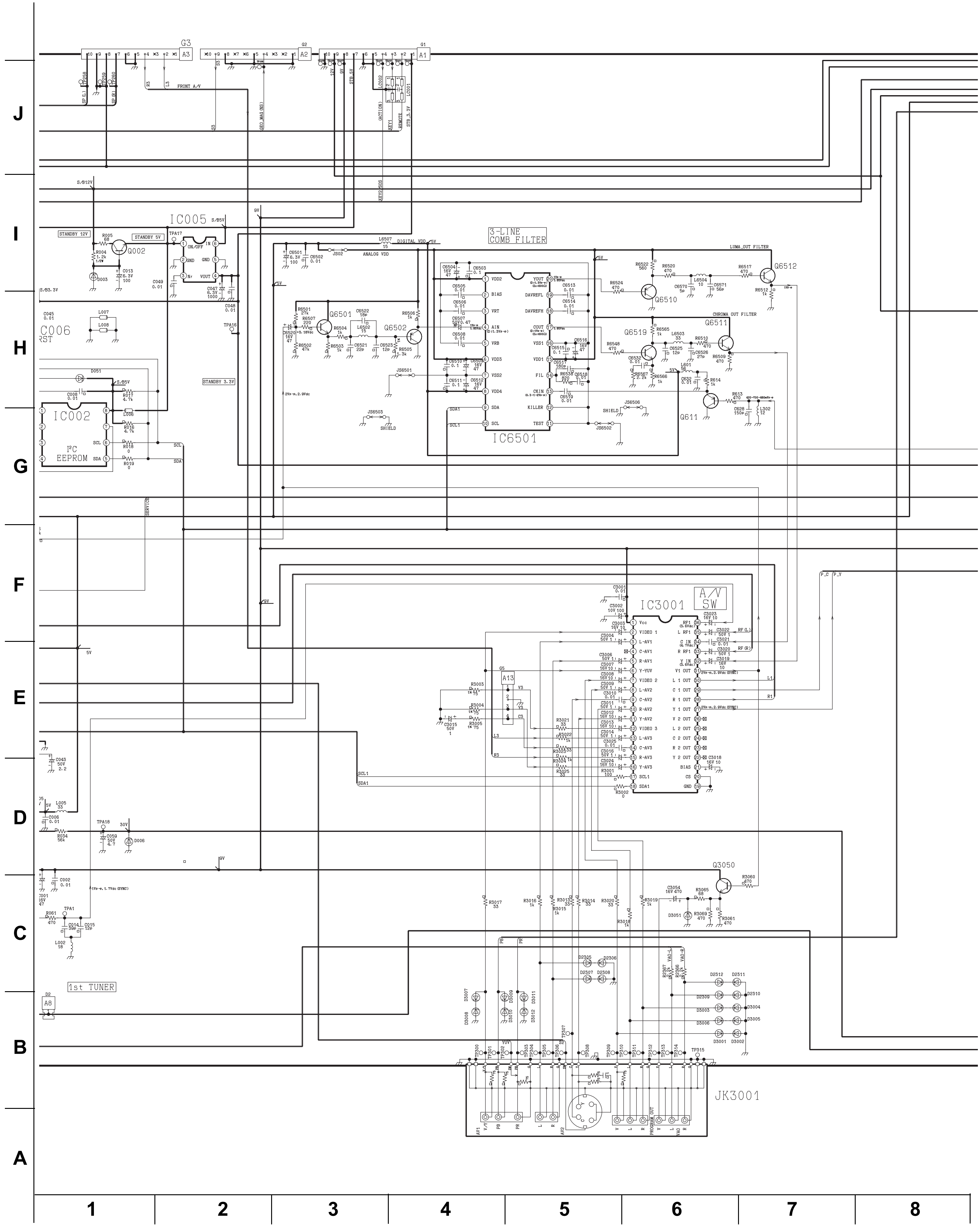
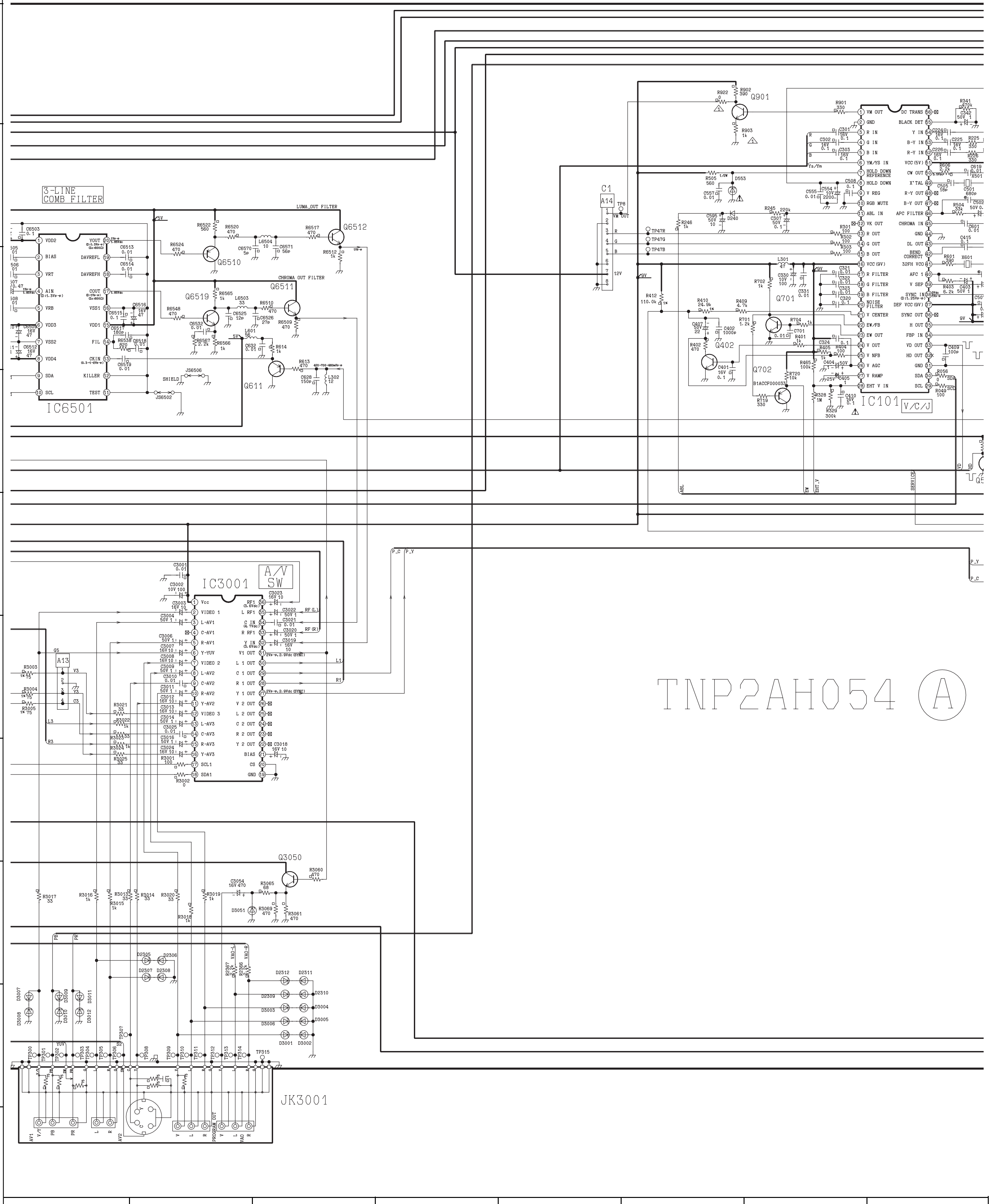
8

A-BOARD 1/4 TNP2AH054 CT-3233HG


J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
G3
A3
G2
A2
G1
A1
FRONT A/V
S/B12V
IC005
S/B5V
STANDBY 12V
STANDBY 5V
Q002
D003
ON/OFF
IN
GND
Nr
VOUT
S/B3.3V
3-LINE
COMB FILTER
DIGITAL VDD
ANALOG VDD
LUMA_OUT FILTER
CHROMA OUT FILTER
Q6501
Q6502
Q6510
Q6511
Q6512
Q6519
Q611
IC6501
VDD2
BIAS
VRT
AIN
VRB
VDD3
VSS2
VDD4
SDA
SCL
YOUT
DAVREFL
DAVREFH
COUT
VSS1
VDD1
FIL
CKIN
KILLER
TEST
SHIELD
STANDBY 3.3V
IC002
I²C
EEPROM
SCL
SDA
IC3001
A/V
SW
Vcc
VIDEO 1
L-AV1
C-AV1
R-AV1
Y-YUV
VIDEO 2
L-AV2
C-AV2
R-AV2
Y-AV2
VIDEO 3
L-AV3
C-AV3
R-AV3
Y-AV3
SCL1
SDA1
L RF1
C IN
R RF1
Y IN
V1 OUT
L 1 OUT
C 1 OUT
R 1 OUT
Y 1 OUT
Y 2 OUT
L 2 OUT
C 2 OUT
R 2 OUT
BIAS
CS
GND
RF(L)
RF(R)
P_C
P_Y
G5
A13
Q3050
1st TUNER
D2
A8
JK3001
AV1
AV2
PB
PR
PROGRAM OUT
VAO



3-LINE COMB FILTER
IC6501
VDD2
BIAS
VRT
AIN
VRB
VDD3
VSS2
VDD4
SDA
SCL
YOUT
DAVREFL
DAVREFH
COUT
VSS1
VDD1
FIL
CKIN
KILLER
TEST
LUMA_OUT FILTER
CHROMA OUT FILTER
Q6510
Q6512
Q6519
Q6511
Q611
SHIELD
JS6506
JS6502
IC3001
A/V SW
Vcc
VIDEO 1
L-AV1
C-AV1
R-AV1
Y-YUV
VIDEO 2
L-AV2
C-AV2
R-AV2
Y-AV2
VIDEO 3
L-AV3
C-AV3
R-AV3
Y-AV3
SCL1
SDA1
RF1
L RF1
C IN
R RF1
Y IN
V1 OUT
L 1 OUT
C 1 OUT
R 1 OUT
Y 1 OUT
V 2 OUT
L 2 OUT
C 2 OUT
R 2 OUT
Y 2 OUT
BIAS
CS
GND
RF(L)
RF(R)
P_C
P_Y
A13
G5
Q3050
D3051
JK3001
AV1
V/Y
PB
PR
L
R
AV2
PROGRAM OUT
VAO
C1
A14
TP8
VM OUT
TP47R
TP47G
TP47B
12V
9V
Q901
Q701
Q402
Q702
B1ACCF000033
IC101
V/C/J
VM OUT
GND
R IN
G IN
B IN
YM/YS IN
HOLD DOWN REFERENCE
HOLD DOWN
V REG
RGB MUTE
ABL IN
VK OUT
R OUT
G OUT
B OUT
VCC(9V)
R FILTER
G FILTER
B FILTER
NOISE FILTER
V CENTER
EW/FB
EW OUT
V OUT
V NFB
V AGC
V RAMP
EHT V IN
DC TRANS
BLACK DET
Y IN
B-Y IN
R-Y IN
VCC(5V)
CW OUT
X'TAL
R-Y OUT
B-Y OUT
APC FILTER
CHROMA IN
GND
DL OUT
BEND CORRECT
32FH VCO
AFC 1
V SEP
SYNC IN
DEF VCC(9V)
SYNC OUT
H OUT
FBP IN
VD OUT
HD OUT
GND
SDA
SCL
X501
X601
ABL
EHT_V
SERVICE
TNP2AH054
A
J
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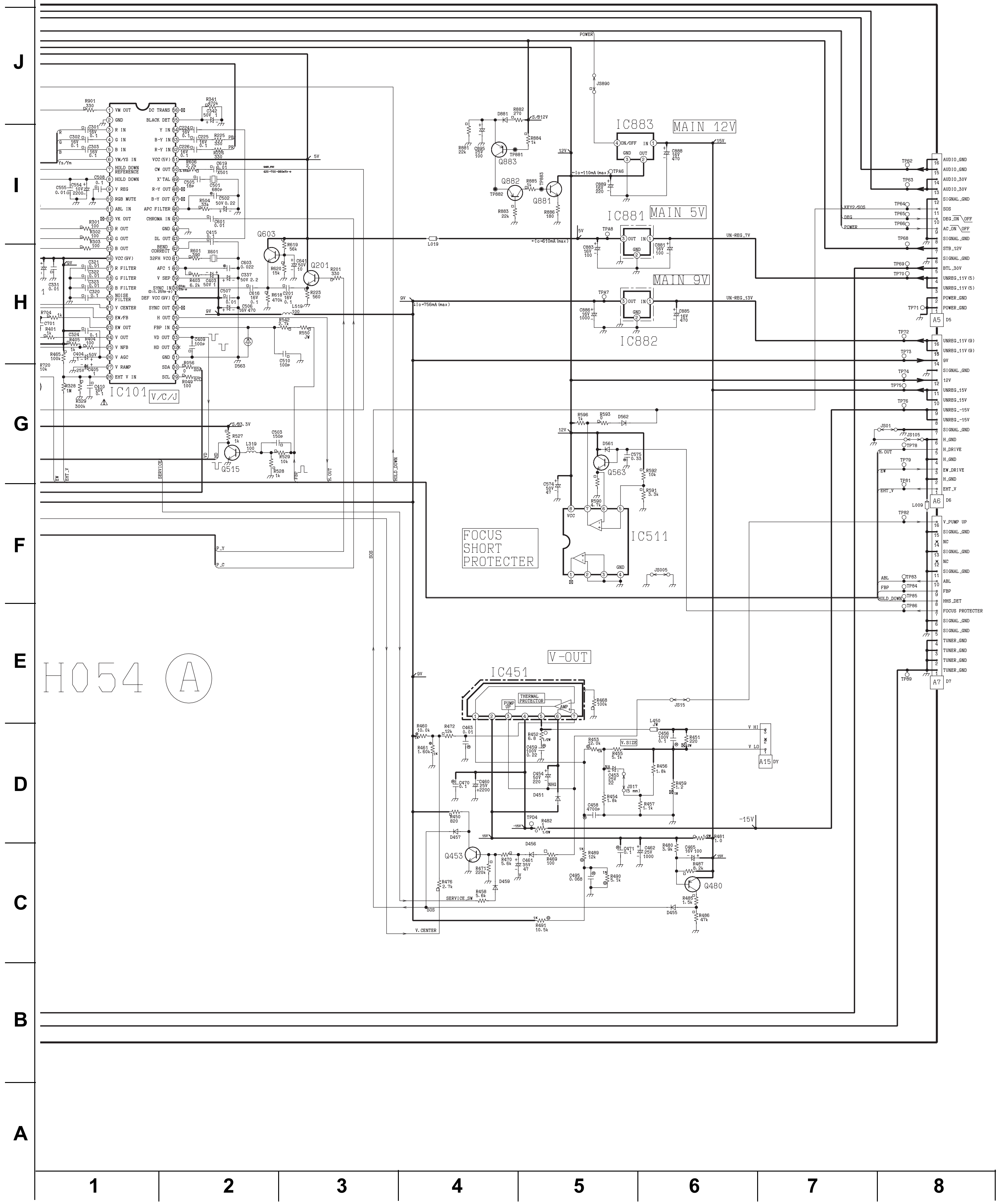

J
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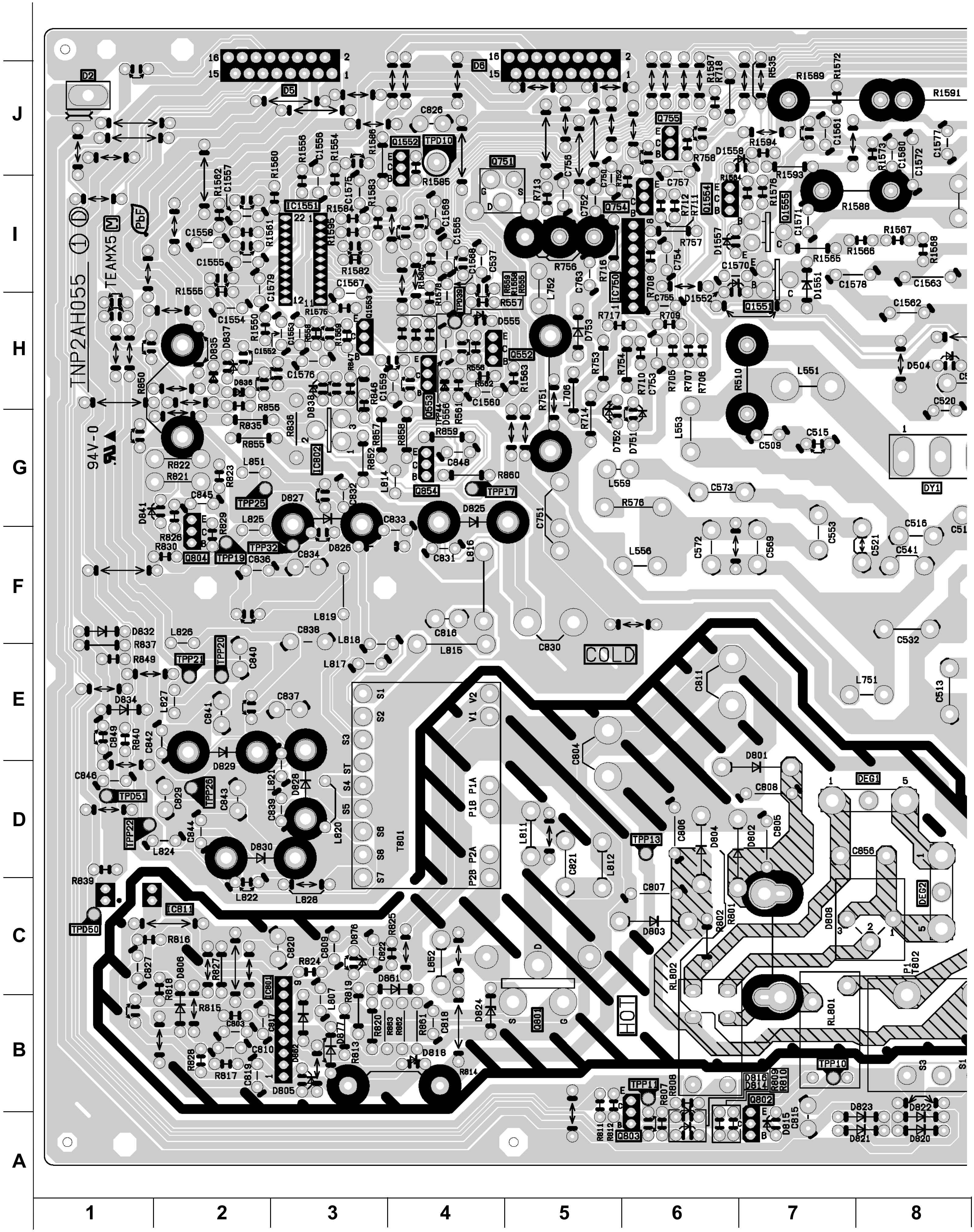
8
IC101
V/C/J
IC883
MAIN 12V
IC881
MAIN 5V
MAIN 9V
IC882
IC511
FOCUS SHORT PROTECTER
IC451
V-OUT
H054
A
Q603
Q201
Q515
Q563
Q881
Q882
Q883
Q453
Q480
A5
A6
A7
A15
AUDIO_GND
AUDIO_30V
SIGNAL_GND
SOS
DEG_ON OFF
AC_ON OFF
STB_12V
BTL_30V
UNREG_11V(5)
POWER_GND
UNREG_11V(9)
9V
12V
UNREG_15V
UNREG_-15V
H_GND
H_DRIVE
EW_DRIVE
EHT_V
V_PUMP UP
NC
ABL
FBP
HHS_DET
FOCUS PROTECTER
TUNER_GND
UN-REG_7V
UN-REG_13V
POWER
-15V
V HI
V LO
DY


J
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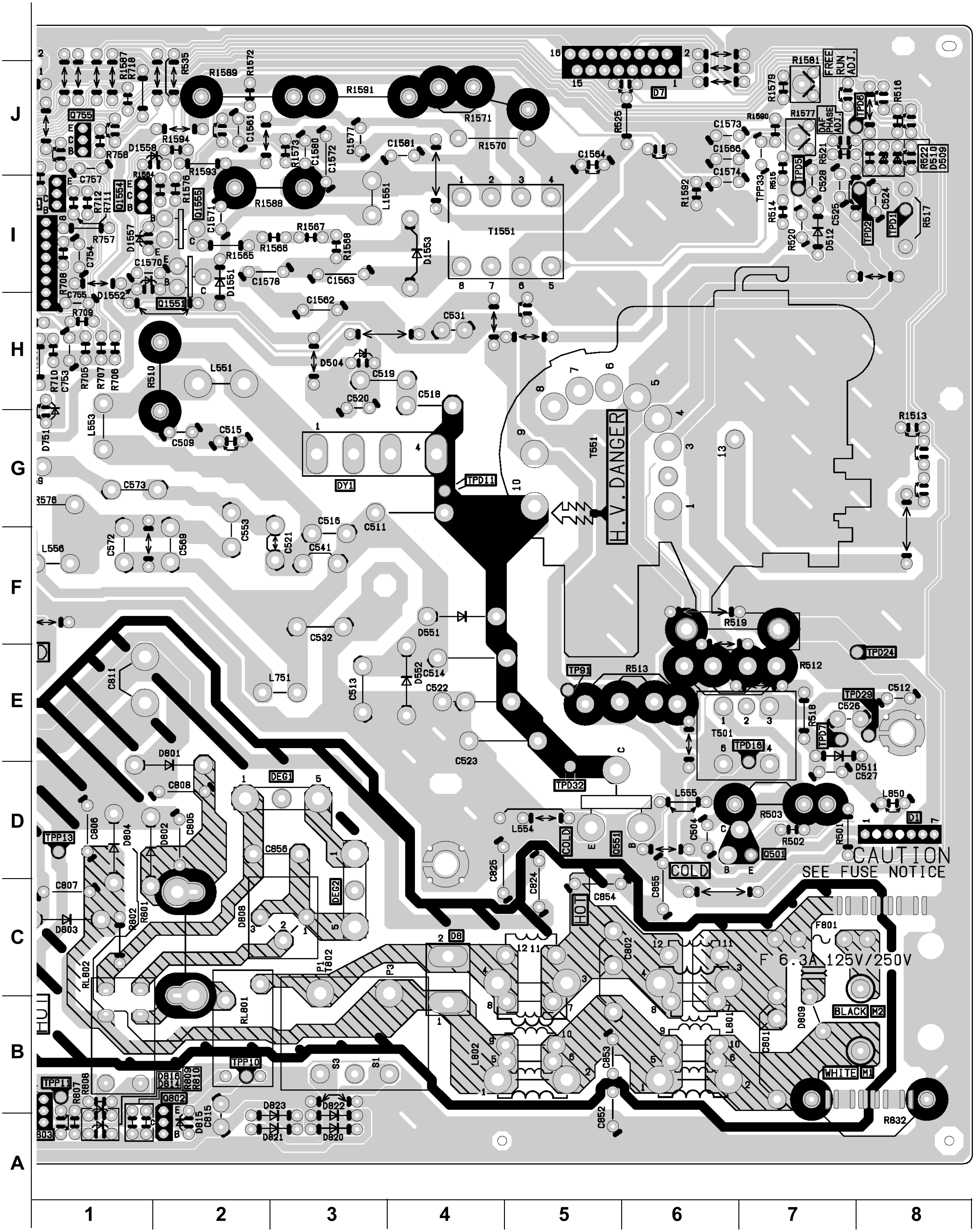
8
TNP2AH055
TEAMX5
PbF
94V-0
COLD
HOT
D2
D5
D6
IC1551
IC1553
IC750
IC802
IC801
IC811
Q751
Q755
Q754
Q1552
Q1554
Q1555
Q1551
Q552
Q553
Q854
Q804
Q801
Q802
Q803
TPD10
TPD39
TPD50
TPD51
TPP10
TPP11
TPP13
TPP17
TPP19
TPP20
TPP21
TPP22
TPP25
TPP26
TPP32
T801
T802
DY1
DEG1
DEG2
RL801
RL802
R1589
R1591
R1588
R510
L551
L556
L559
L751
C826
C830
C811
C804
D801
D825
D826
D827
D829
D830
L815
L816
L817
L818
L819
S1
S2
S3
S4
S5
S6
S7
S8
ST
V1
V2
P1A
P1B
P2A
P2B

D-BOARD 1/2 TNP2AH055 CT-3233HG


J
I
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D
C
B
A
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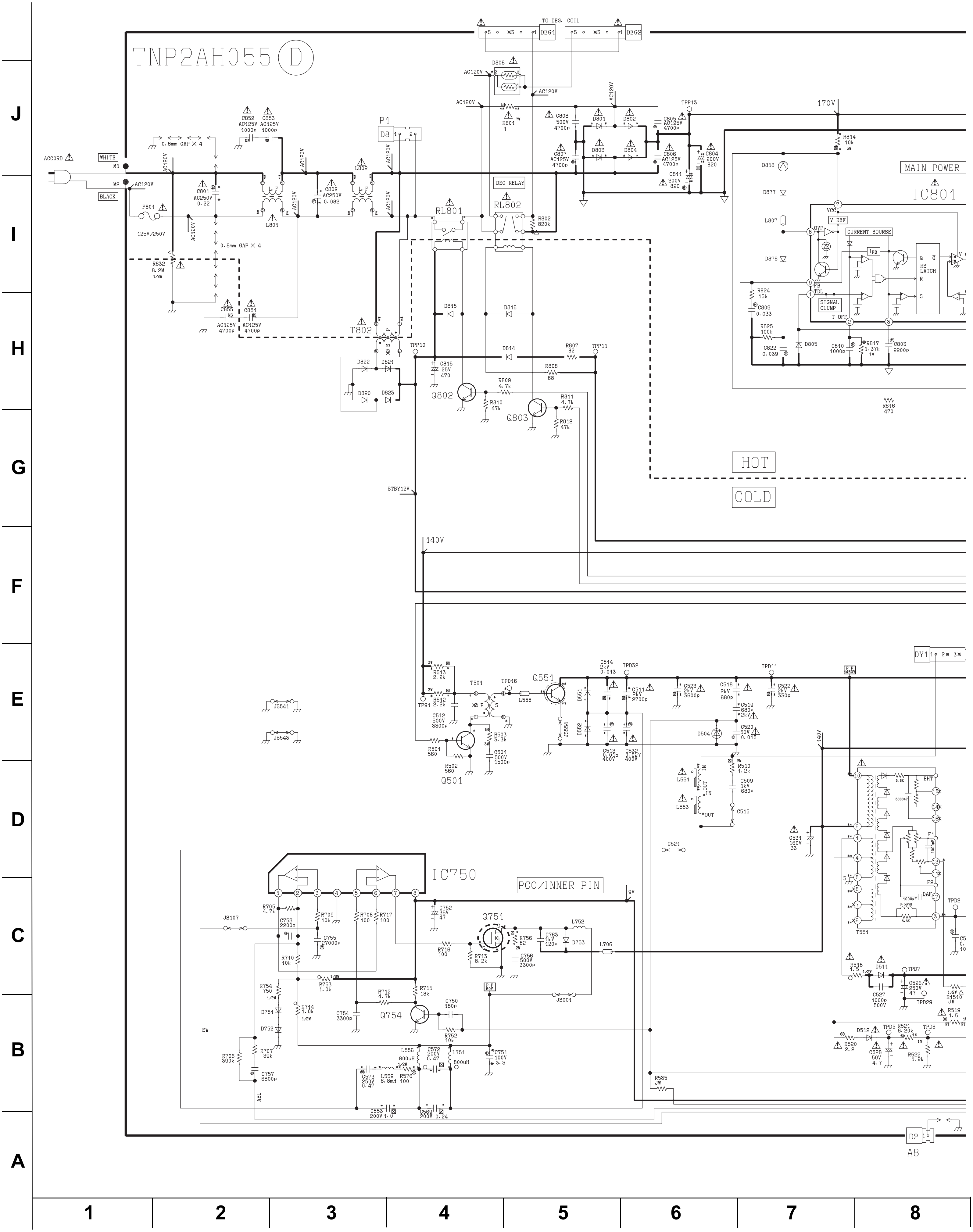
5
6
7
8
R1589
R1591
R1571
R1570
R1588
R1593
R1594
R1567
R1566
R1565
R1568
T1551
D1553
D1551
D1552
D1557
D1558
Q1551
Q1554
Q1555
Q755
C1570
C1571
C1561
C1580
C1572
C1577
C1581
C1564
C1573
C1566
C1574
C1578
C1563
C1562
L1551
R1572
R1573
R1576
R1584
R1587
R718
R535
R525
R1592
R1590
R1579
R1581
R1577
FREE RUN ADJ.
DAF PHASE ADJ.
TPD6
TPD5
TPD2
TPD1
R516
R521
R522
D510
D509
TP33
R515
R514
R520
D512
C528
C525
C524
R517
D7
16
15
R758
C757
R712
R711
R757
C754
R708
C755
R709
R710
C753
R705
R707
R706
D751
C531
D504
C519
C520
C518
R510
L551
L553
C509
C515
DY1
TPD11
T551
H.V. DANGER
C573
R576
C516
C511
C553
C521
C541
C572
C569
L556
D551
C532
L751
C811
C513
D552
C514
C522
C523
R519
R513
R512
TP91
TPD24
TPD29
C512
C526
R518
T501
TPD16
TPD7
D511
C527
TPD32
R1513
D801
C808
DEG1
DEG2
C856
C806
D804
D802
C805
TPP13
C807
D803
R802
R801
D808
L555
R503
L554
C504
R501
R502
Q551
Q501
L850
D1
COLD
HOT
CAUTION
SEE FUSE NOTICE
C825
C824
C855
C854
C802
D8
T802
RL802
RL801
L802
C853
L801
C801
D809
F801
F 6.3A 125V/250V
BLACK
M2
WHITE
M1
R832
C852
TPP10
TPP11
R808
R807
D816
D814
R809
R810
Q802
D815
C815
D823
D821
D822
D820
S3
S1
P1
P3

D-BOARD 2/2 TNP2AH055 CT-3233HG


TNP2AH055 (D)
TO DEG. COIL
DEG1
DEG2
ACCORD
WHITE
BLACK
M1
M2
AC120V
F801
125V/250V
0.8mm GAP × 4
C852 AC125V 1000p
C853 AC125V 1000p
C801 AC250V 0.22
C802 AC250V 0.082
L801
L802
L.F
R832 8.2M 1/2W
C855 AC125V 4700p
C854 AC125V 4700p
T802
P1
D8
D808
R801 1 7W
DEG RELAY
RL801
RL802
R802 820k
C808 500V 4700p
C807 AC125V 4700p
C805 AC125V 4700p
C806 AC125V 4700p
D801
D802
D803
D804
C811 200V 820
C804 200V 820
TPP13
170V
R814 10k 3W
MAIN POWER
IC801
D818
D877
L807
D876
VCC
OVP
V REF
CURRENT SOURSE
IFB
RS LATCH
FB TDL
SIGNAL CLUMP
T OFF
R824 15k
C809 0.033
R825 100k
C822 0.039
D805
C810 1000p
R817 1.37k 1%
C803 2200p
R816 470
D815
D816
D814
D822
D821
D820
D823
TPP10
C815 25V 470
R807 82
TPP11
R808 68
R809 4.7k
R810 47k
Q802
R811 4.7k
R812 47k
Q803
HOT
COLD
STBY12V
140V
R513 2.2k
R512 2.2k
TP91
C512 500V 3300p
T501
TPD16
L555
Q551
R501 560
R502 560
Q501
R503 3.3k
C504 500V 1500p
C514 2kV 0.013
TPD32
D551
C511 2kV 2700p
C523 2kV 3600p
C518 2kV 680p
C519 2kV
C520 50V 0.015
TPD11
C522 2kV 330p
P-P 1450V
DY1
D552
JS554
C513 0.015 400V
C532 0.027 400V
D504
R510 1.2k
C509 1kV 680p
C515
L551
L553
IN
OUT
C521
C531 160V 33
JS541
JS543
IC750
PCC/INNER PIN
9V
R705 4.7k
R709 10k
R708 100
R717 100
C753 2200p
C755 27000p
R710 10k
JS107
C752 35V 47
Q751
R716 100
R713 8.2k
R756 82
C756 500V 3300p
C763 1kV 120p
L752
D753
L706
P-P 60V
JS001
R754 750 1/2W
R753 1.0k
R712 4.7k
R711 18k
R714 1.0k 1/2W
C754 3300p
Q754
C750 180p
R752 10k
D751
D752
EW
R706 390k
R707 39k
C757 6800p
ABL
L556 800uH
C572 200V 0.47
L751 800uH
C751 100V 3.3
C573 250V 0.47
L559 6.8mH
R576 100
R535 JW
C553 200V 1.0
C569 200V 0.24
T551
EHT
F1
F2
DAF
TPD2
R518 1.5
D511
TPD7
C527 1000p 500V
C526 250V 47
TPD29
R1510 JW
R519 1.5
D512
TPD5
R521 8.20k
TPD6
R520 2.2
C528 50V 4.7
R522 1.2k
D2
A8
J
I
H
G
F
E
D
C
B
A
1
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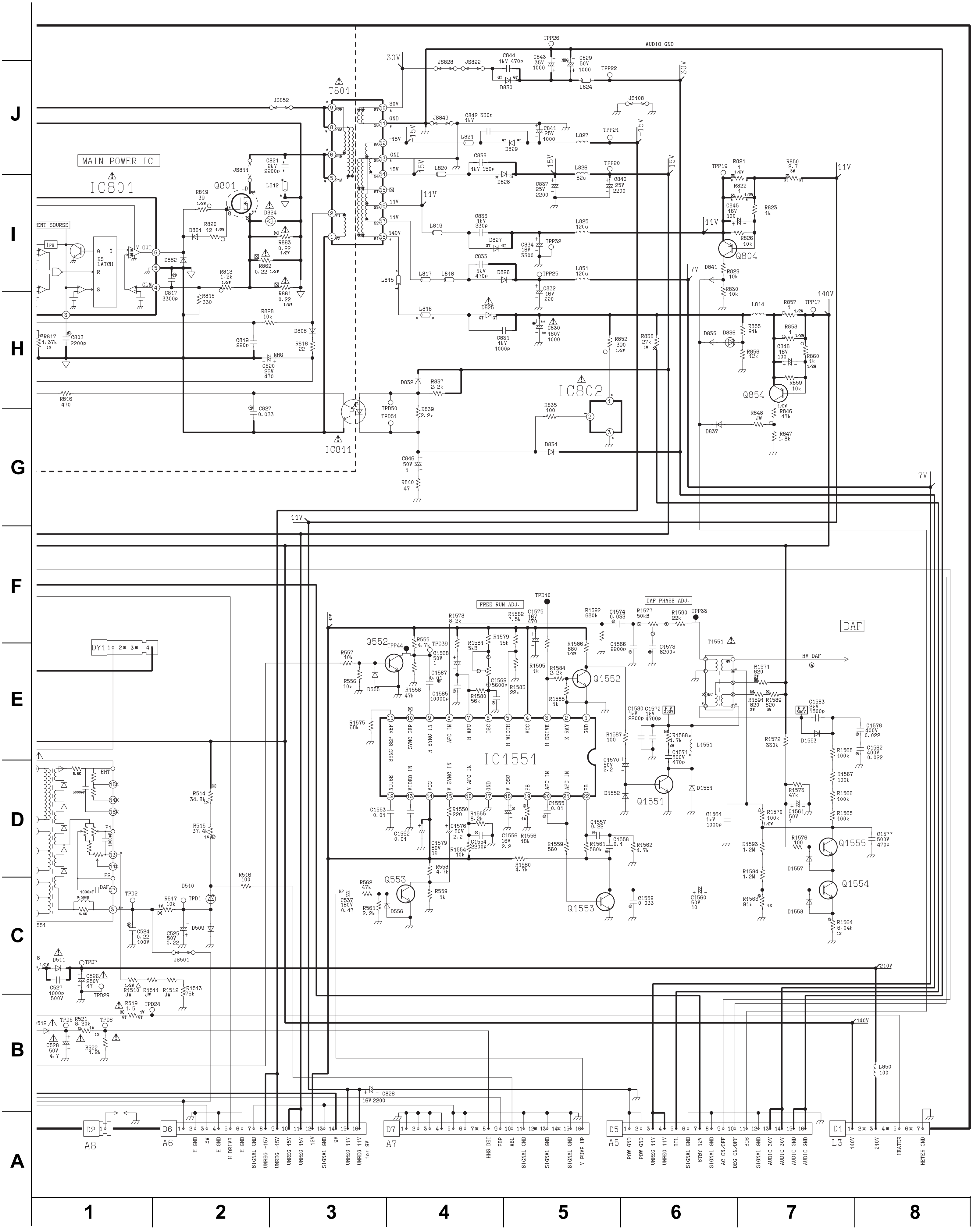
8


MAIN POWER IC
IC801
T801
Q801
IC802
IC811
Q804
Q854
AUDIO GND
30V
-15V
15V
11V
7V
140V
210V
12V
ENT SOURSE
RS LATCH
V OUT
CLM
FREE RUN ADJ.
DAF PHASE ADJ.
DAF
HV DAF
T1551
IC1551
Q552
Q553
Q1551
Q1552
Q1553
Q1554
Q1555
DY1
SYNC SEP REF
SYNC SEP
H SYNC IN
AFC IN
H AFC
OSC
H WIDTH
VCC
H DRIVE
X RAY
GND
NOISE
VIDEO IN
V SYNC IN
V AFC IN
V OSC
FB
AFC IN
EHT
DAF
JS501
D2
A8
D6
A6
H GND
EW
H GND
H DRIVE
H GND
SIGNAL GND
UNREG -15V
UNREG -15V
UNREG 15V
UNREG 15V
12V
SIGNAL GND
9V
UNREG 11V
UNREG 11V for 9V
D7
A7
HHS DET
FBP
ABL
SIGNAL GND
SIGNAL GND
SIGNAL GND
V PUMP UP
D5
A5
POW GND
POW GND
UNREG 11V
UNREG 11V
BTL
SIGNAL GND
STBY 12V
SIGNAL GND
AC ON/OFF
DEG ON/OFF
SOS
SIGNAL GND
AUDIO 30V
AUDIO 30V
AUDIO GND
AUDIO GND
D1
L3
140V
210V
HEATER
HETER GND
A
B
C
D
E
F
G
H
I
J
1
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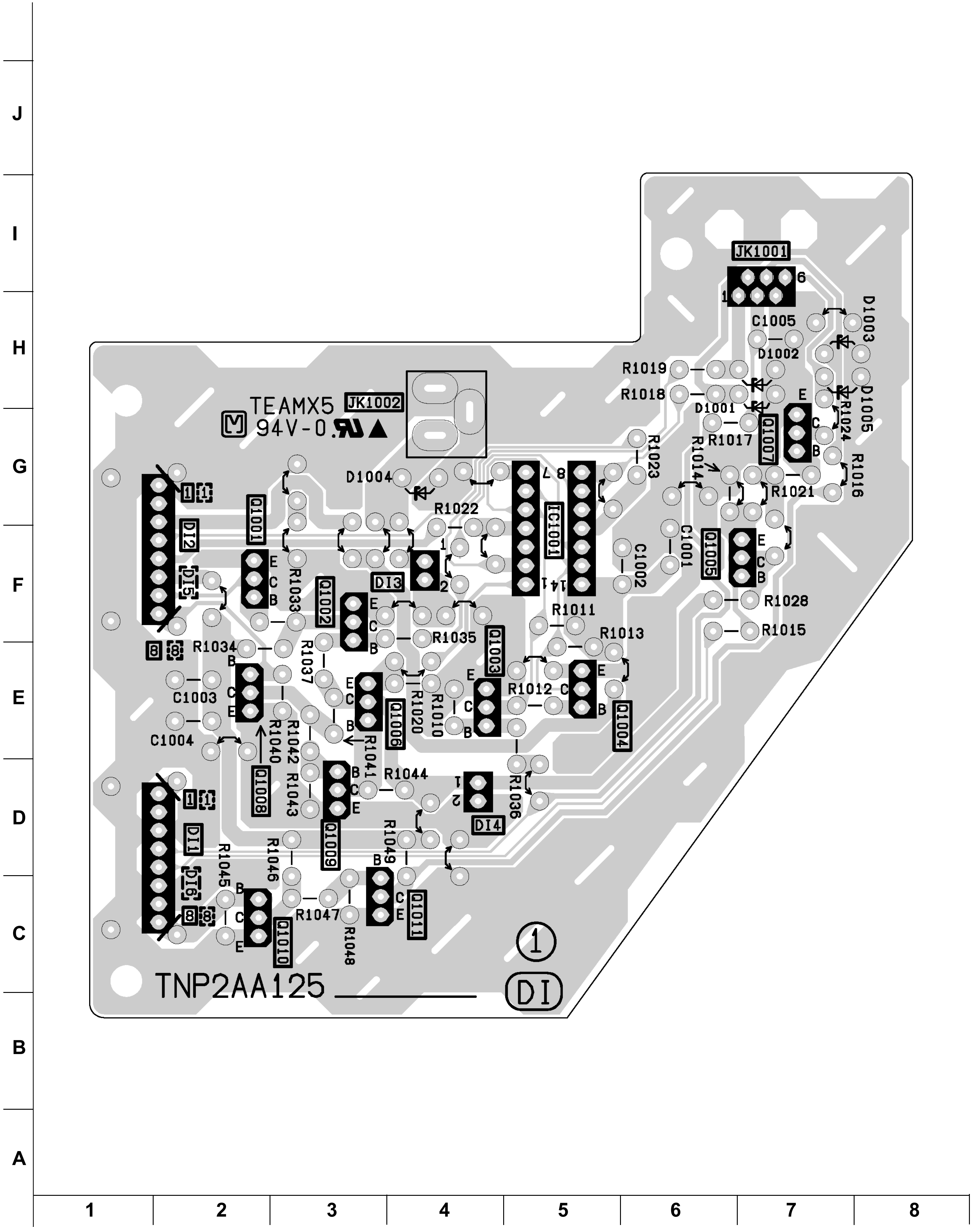J
I
H
G
F
E
D
C
B
A
1
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3
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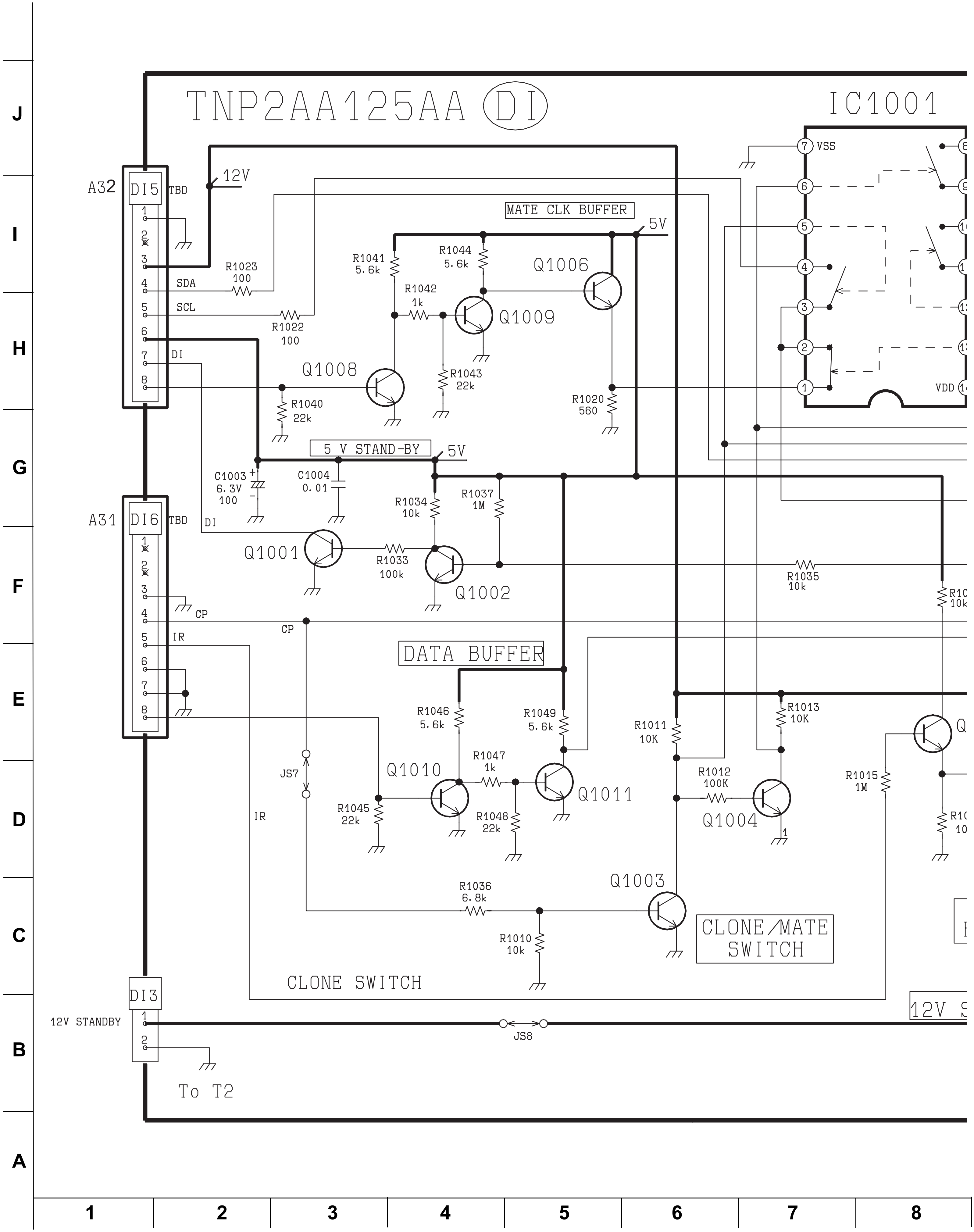
5
6
7
8
TEAMX5
JK1002
94V-0
JK1001
6
1
C1005
D1003
D1002
R1019
R1018
D1001
D1005
E
C
B
Q1007
R1024
R1017
R1023
R1014
R1016
R1021
D1004
8
7
IC1001
14
1
R1022
1
2
DI3
C1002
C1001
Q1005
R1028
R1015
R1011
R1013
DI1
DI2
DI5
8
Q1001
R1033
Q1002
R1035
Q1003
R1034
R1037
C1003
C1004
R1040
R1042
R1043
Q1008
Q1006
R1020
R1010
R1041
R1012
Q1004
R1036
R1044
DI4
Q1009
R1049
DI1
DI6
R1045
R1046
R1047
R1048
Q1010
Q1011
TNP2AA125
1
DI


TNP2AA125AA
DI
IC1001
A32
DI5
TBD
12V
MATE CLK BUFFER
5V
SDA
SCL
DI
R1023
100
R1022
100
R1041
5.6k
R1044
5.6k
R1042
1k
Q1006
Q1009
Q1008
R1043
22k
R1040
22k
R1020
560
VSS
VDD
5 V STAND-BY
5V
C1003
6.3V
100
C1004
0.01
R1034
10k
R1037
1M
A31
DI6
TBD
DI
Q1001
R1033
100k
Q1002
R1035
10k
CP
CP
IR
DATA BUFFER
R1046
5.6k
R1049
5.6k
R1011
10K
R1013
10K
R1047
1k
R1012
100K
Q1010
Q1011
Q1004
R1015
1M
JS7
R1045
22k
R1048
22k
IR
R1036
6.8k
Q1003
CLONE/MATE
SWITCH
R1010
10k
CLONE SWITCH
DI3
12V STANDBY
JS8
To T2
J
I
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G
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E
D
C
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A
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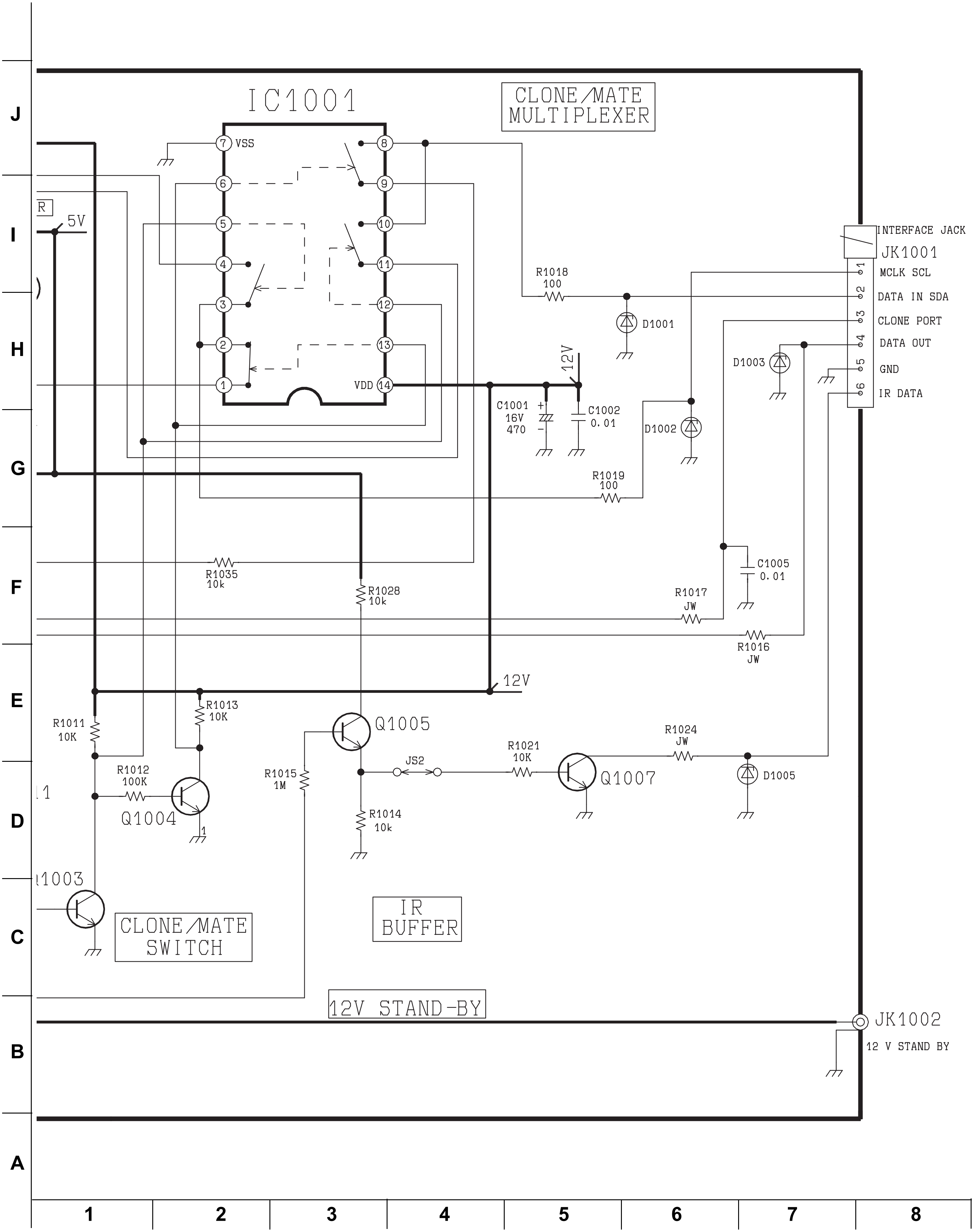
IC1001
CLONE/MATE MULTIPLEXER
VSS
VDD
INTERFACE JACK
JK1001
MCLK SCL
DATA IN SDA
CLONE PORT
DATA OUT
GND
IR DATA
5V
12V
R1018 100
D1001
D1003
D1002
C1001 16V 470
C1002 0.01
R1019 100
C1005 0.01
R1017 JW
R1016 JW
R1035 10k
R1028 10k
R1011 10K
R1013 10K
R1012 100K
Q1004
Q1005
R1015 1M
JS2
R1021 10K
Q1007
R1024 JW
D1005
R1014 10k
Q1003
CLONE/MATE SWITCH
IR BUFFER
12V STAND-BY
JK1002
12 V STAND BY
J
I
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G
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C
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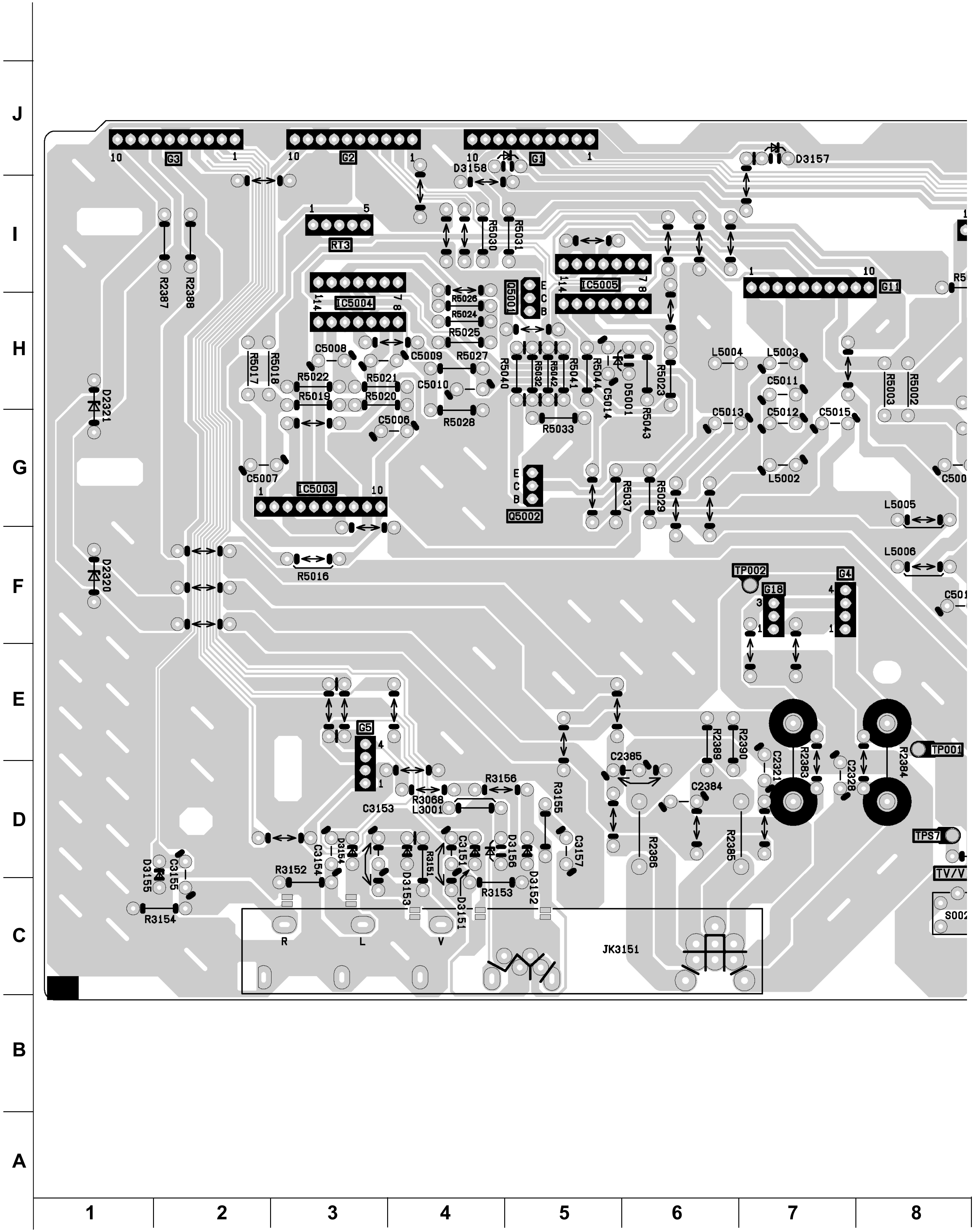

J
I
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D
C
B
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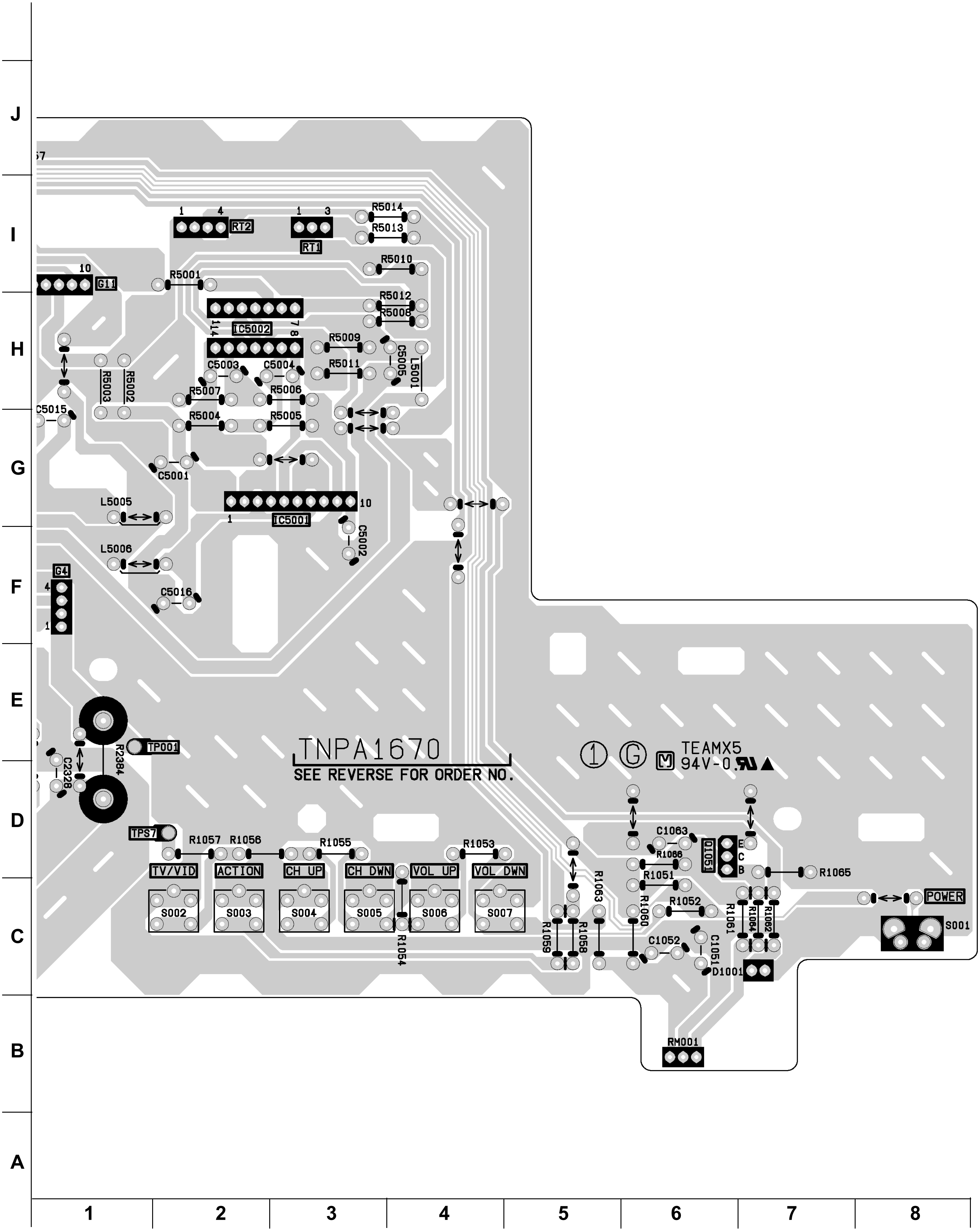
5
6
7
8
G3
G2
G1
10
1
D3158
D3157
RT3
1
5
R5030
R5031
R2387
R2388
IC5005
Q5001
E
C
B
114
7
8
G11
IC5004
R5026
R5024
R5025
R5027
C5008
C5009
R5017
R5018
R5022
R5021
R5019
R5020
C5010
R5040
R5032
R5042
R5041
R5044
C5014
D5001
R5023
R5043
L5004
L5003
C5011
R5003
R5002
C5013
C5012
C5015
R5028
R5033
C5006
D2321
C5007
IC5003
Q5002
R5037
R5029
L5002
L5005
L5006
D2320
R5016
TP002
G4
G18
3
4
G5
C2385
R2389
R2390
C2321
R2383
C2328
R2384
TP001
R3156
R3155
C3157
R3068
L3001
C3153
C2384
R2386
R2385
TPS7
TV/V
R3152
C3154
D3154
D3153
R3151
C3151
D3151
D3156
D3152
R3153
D3155
C3155
R3154
R
L
V
JK3151
S002



J
I
H
G
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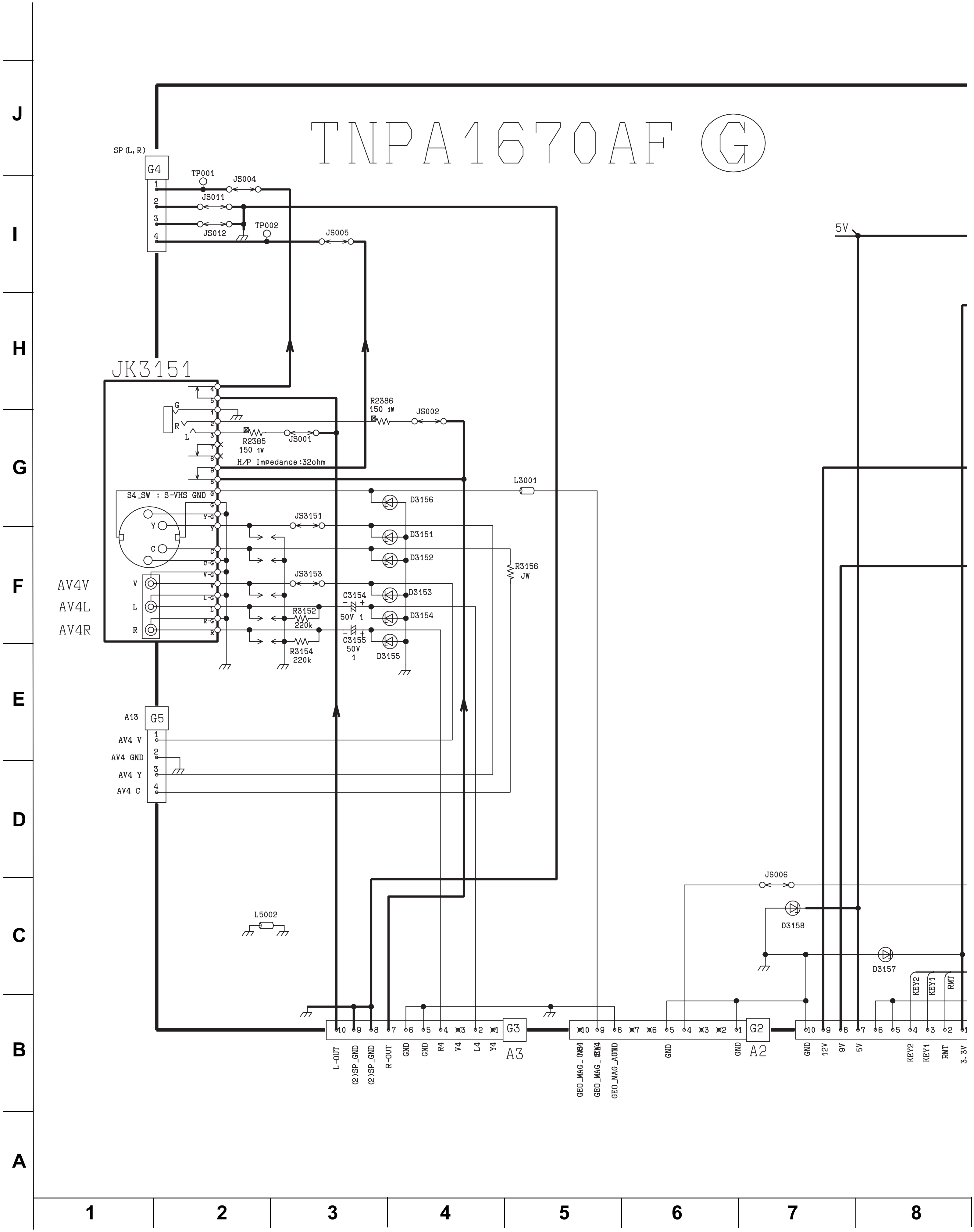
E
D
C
B
A
1
2
3
4
5
6
7
8
RT2
RT1
R5014
R5013
R5010
R5001
G11
R5012
R5008
IC5002
R5009
C5005
L5001
R5011
C5003
C5004
R5003
R5002
R5007
R5006
C5015
R5004
R5005
C5001
L5005
IC5001
C5002
L5006
G4
C5016
TP001
R2384
C2328
TNPA1670
SEE REVERSE FOR ORDER NO.
TEAMX5
94V-0
TPS7
R1057
R1056
R1055
R1053
C1063
R1066
D1051
R1065
R1051
R1052
R1063
R1060
R1061
R1064
R1062
POWER
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
S002
S003
S004
S005
S006
S007
S001
R1054
R1059
R1058
C1052
C1051
D1001
RM001



TNPA1670AF Ⓖ
SP(L,R)
G4
TP001
JS004
JS011
JS012
TP002
JS005
5V
JK3151
R2386
150 1W
JS002
R2385
150 1W
JS001
H/P Impedance:32ohm
L3001
S4_SW : S-VHS GND
D3156
JS3151
D3151
D3152
R3156
JW
JS3153
C3154
D3153
AV4V
AV4L
AV4R
R3152
220k
50V 1
D3154
C3155
50V
1
R3154
220k
D3155
A13
G5
AV4 V
AV4 GND
AV4 Y
AV4 C
L5002
JS006
D3158
D3157
KEY2
KEY1
RMT
G3
A3
L-OUT
(2)SP_GND
(2)SP_GND
R-OUT
GND
GND
R4
V4
L4
Y4
GEO_MAG_(NS)
GEO_MAG_(EW)
GEO_MAG_(GND)
GND
GND
G2
A2
GND
12V
9V
5V
KEY2
KEY1
RMT
3.3V
J
I
H
G
F
E
D
C
B
A
1
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6
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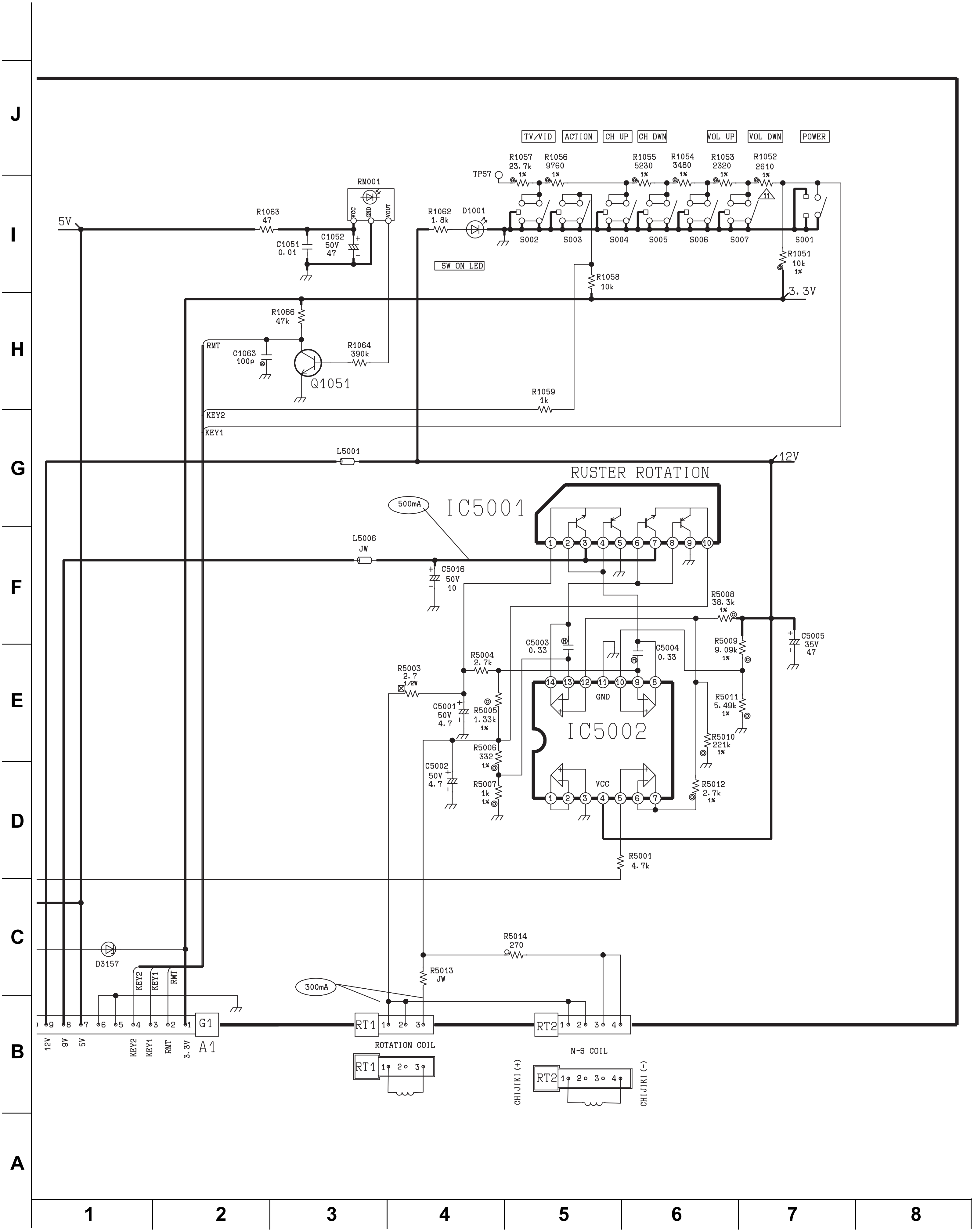
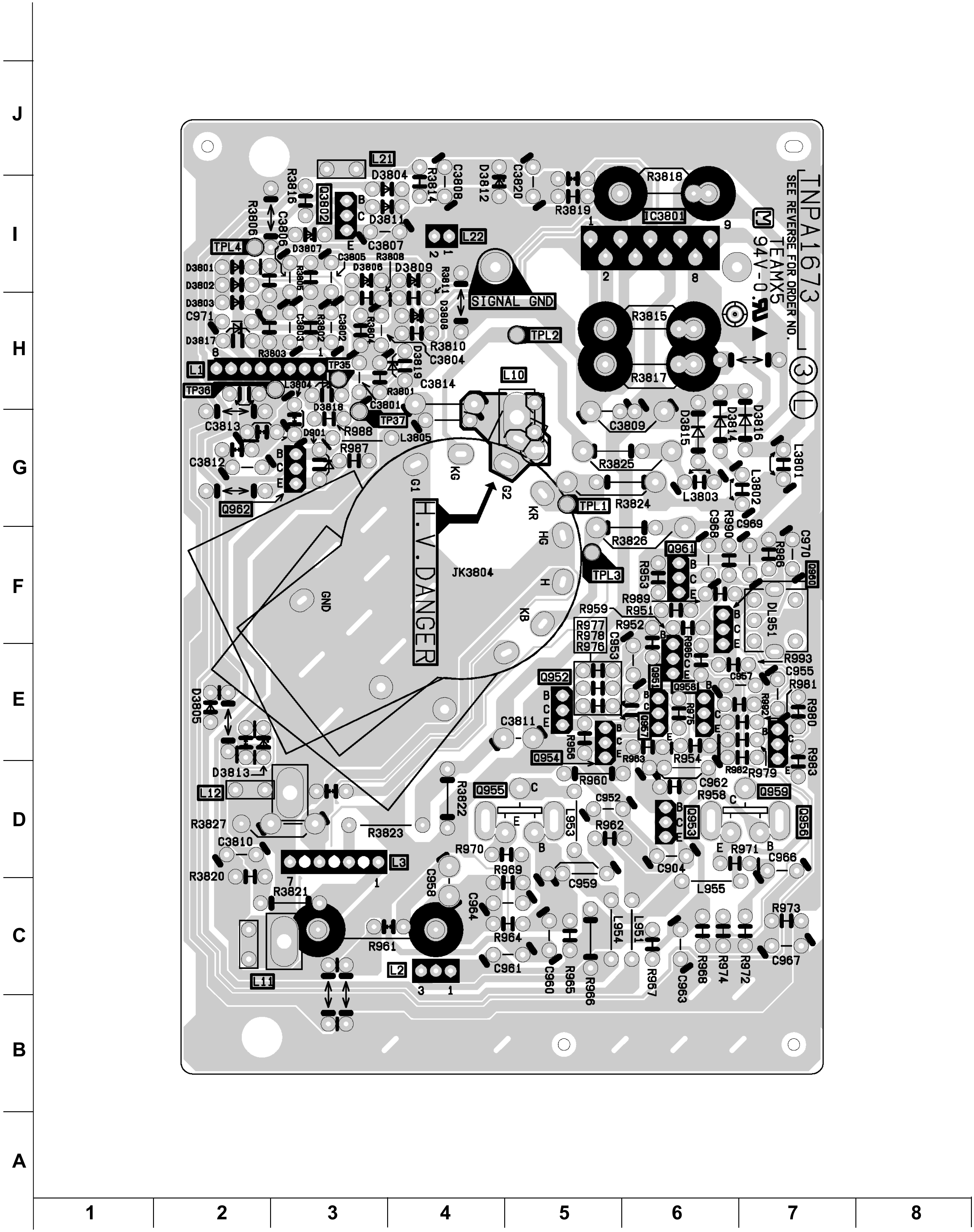
8



J
I
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
POWER
R1057 23.7k 1%
R1056 9760 1%
R1055 5230 1%
R1054 3480 1%
R1053 2320 1%
R1052 2610 1%
TPS7
RM001
VCC
GND
VOUT
R1063 47
5V
C1051 0.01
C1052 50V 47
R1062 1.8k
D1001
S002
S003
S004
S005
S006
S007
S001
SW ON LED
R1058 10k
R1051 10k 1%
3.3V
R1066 47k
RMT
C1063 100p
R1064 390k
Q1051
R1059 1k
KEY2
KEY1
L5001
12V
RUSTER ROTATION
500mA
IC5001
L5006 JW
C5016 50V 10
R5008 38.3k 1%
C5005 35V 47
R5009 9.09k 1%
C5003 0.33
C5004 0.33
R5004 2.7k
R5003 2.7 1/2W
C5001 50V 4.7
R5005 1.33k 1%
GND
IC5002
R5011 5.49k 1%
R5010 221k 1%
R5006 332 1%
C5002 50V 4.7
R5007 1k 1%
VCC
R5012 2.7k 1%
R5001 4.7k
D3157
R5014 270
R5013 JW
300mA
KEY2
KEY1
RMT
G1
12V
9V
5V
KEY2
KEY1
RMT
3.3V
A1
RT1
ROTATION COIL
RT2
N-S COIL
CHIJIKI (+)
CHIJIKI (-)


TNPA1673
SEE REVERSE FOR ORDER NO.
TEAMX5
94V-0
IC3801
SIGNAL GND
H.V.DANGER
JK3804
TPL1
TPL2
TPL3
TPL4
TP35
TP36
TP37
L1
L2
L3
L10
L11
L12
L21
L22
Q3802
Q952
Q953
Q954
Q955
Q956
Q957
Q958
Q959
Q960
Q961
Q962
DL951
R3818
R3819
R3815
R3817
R3825
R3824
R3826
C3809
C3814
C3811
C3810
R3823
R3822
R3827
R3820
R3821
R961
G1
G2
KG
KR
HG
H
KB
GND
J
I
H
G
F
E
D
C
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A
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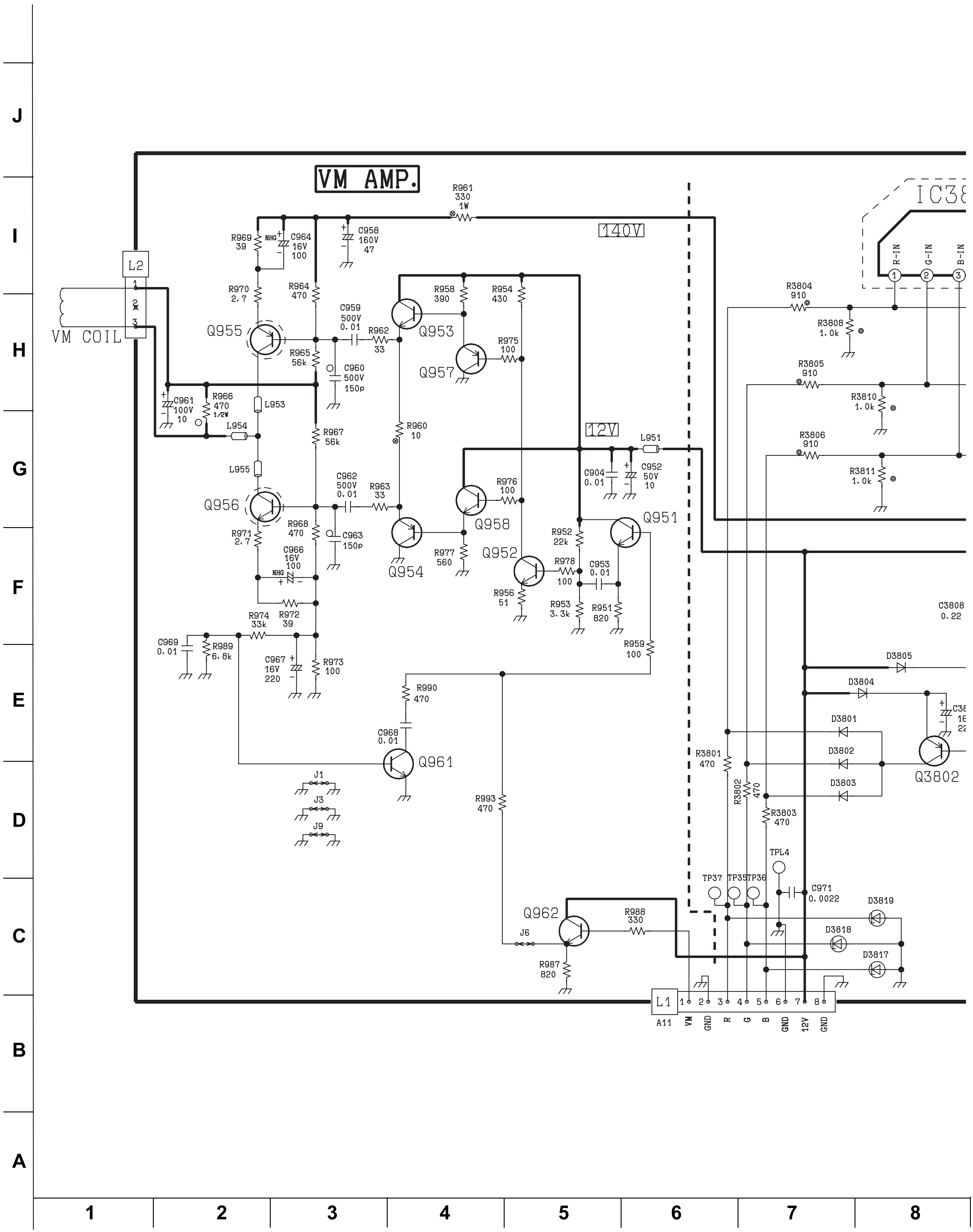
8

L-BOARD TNPA1673 CT-3233HG



J
I
H
G
F
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D
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B
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1
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3
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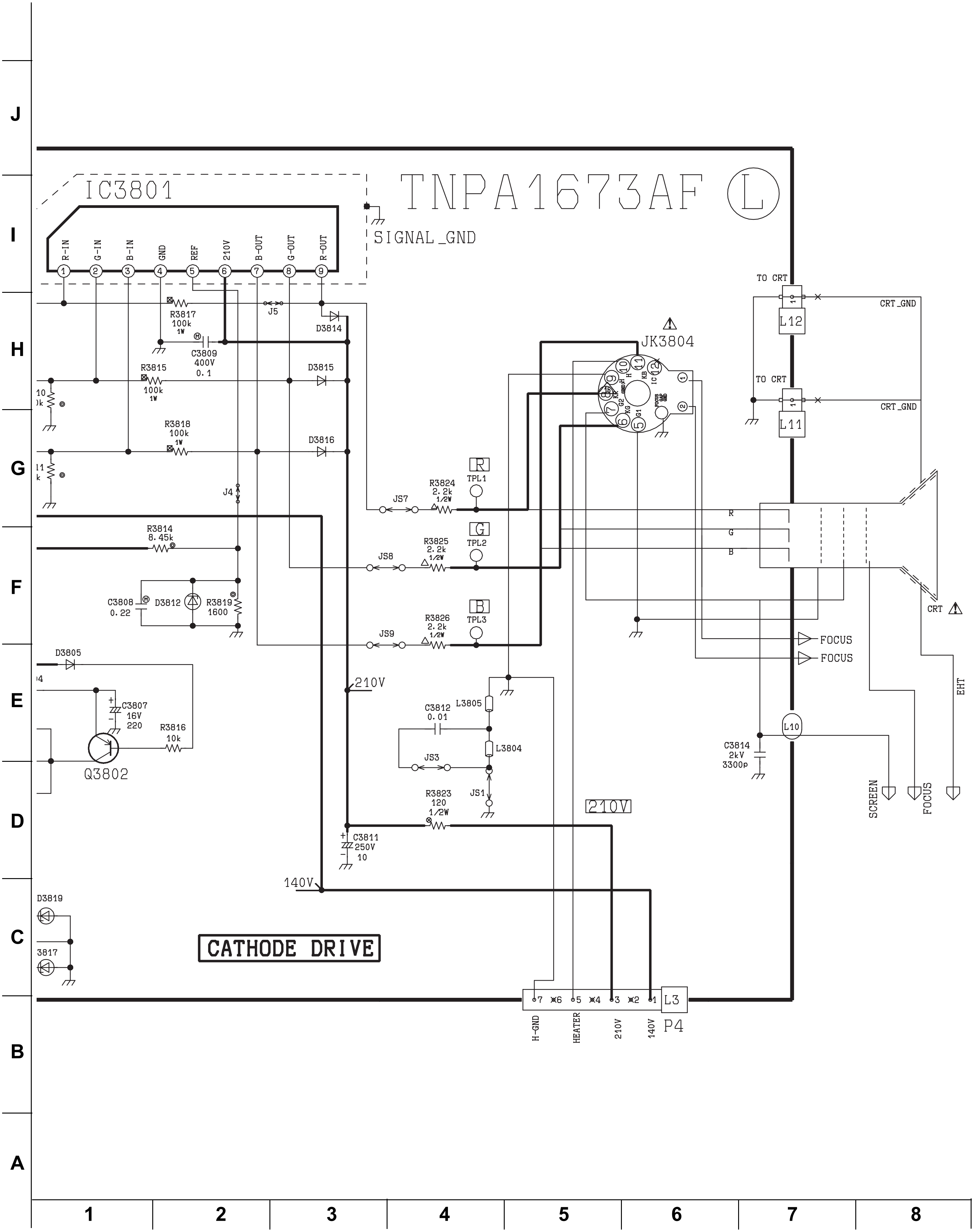
5
6
7
8
VM AMP.
140V
12V
L2
VM COIL
R961 330 1W
R969 39
C964 16V 100
NHG
C958 160V 47
R970 2.7
R964 470
C959 500V 0.01
R962 33
R958 390
R954 430
Q955
Q953
R965 56k
C960 500V 150p
R975 100
Q957
C961 100V 10
R966 470 1/2W
L953
L954
R967 56k
R960 10
L951
L955
C904 0.01
C952 50V 10
C962 500V 0.01
R963 33
R976 100
Q956
Q958
Q951
R968 470
R971 2.7
C963 150p
R952 22k
C966 16V 100
Q954
R977 560
Q952
R978 100
C953 0.01
R956 51
R953 3.3k
R951 820
R974 33k
R972 39
C969 0.01
R989 6.8k
C967 16V 220
R973 100
R959 100
R990 470
C968 0.01
Q961
J1
J3
J9
R993 470
J6
Q962
R988 330
R987 820
L1
A11
1 VM
2 GND
3 R
4 G
5 B
6 GND
7 12V
8 GND
IC38
R-IN
G-IN
B-IN
R3804 910
R3808 1.0k
R3805 910
R3810 1.0k
R3806 910
R3811 1.0k
C3808 0.22
D3805
D3804
C38 16 22
D3801
D3802
D3803
Q3802
R3801 470
R3802 470
R3803 470
TPL4
TP37
TP35
TP36
C971 0.0022
D3819
D3818
D3817


J
I
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G
F
E
D
C
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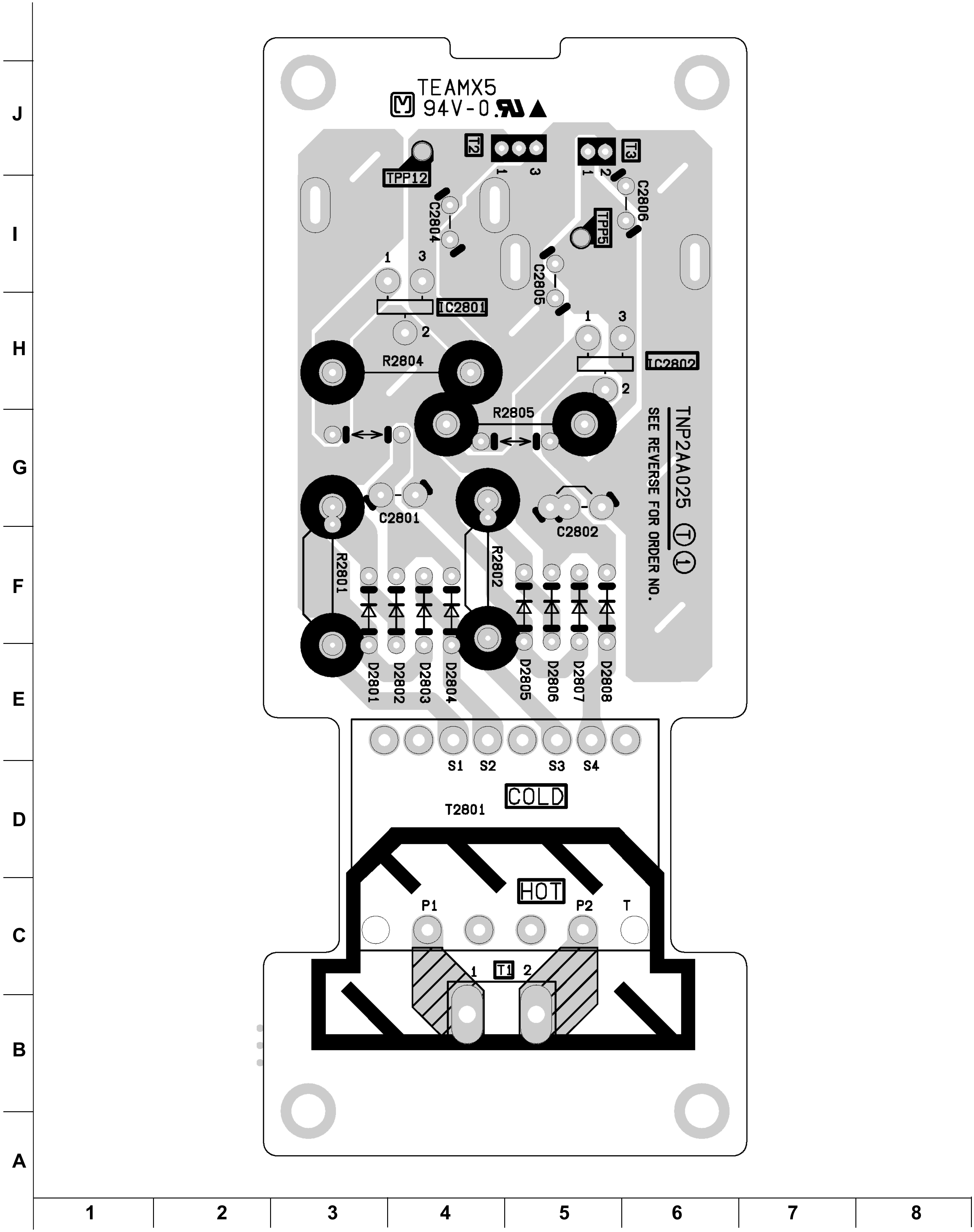
7
8
TNPA1673AF
L
IC3801
R-IN
G-IN
B-IN
GND
REF
210V
B-OUT
G-OUT
R-OUT
1
2
3
4
5
6
7
8
9
SIGNAL_GND
R3817
100k
1W
J5
D3814
C3809
400V
0.1
R3815
100k
1W
D3815
R3818
100k
1W
D3816
J4
R3814
8.45k
C3808
0.22
D3812
R3819
1600
D3805
C3807
16V
220
R3816
10k
Q3802
210V
C3811
250V
10
140V
D3819
3817
CATHODE DRIVE
JK3804
R
TPL1
R3824
2.2k
1/2W
JS7
G
TPL2
R3825
2.2k
1/2W
JS8
B
TPL3
R3826
2.2k
1/2W
JS9
C3812
0.01
L3805
L3804
JS3
JS1
R3823
120
1/2W
210V
7
6
5
4
3
2
1
L3
P4
H-GND
HEATER
210V
140V
TO CRT
L12
CRT_GND
TO CRT
L11
CRT_GND
R
G
B
CRT
FOCUS
FOCUS
EHT
L10
C3814
2kV
3300p
SCREEN
FOCUS


TEAMX5
94V-0
T2
1
3
T3
1
2
TPP12
C2804
C2806
TPP5
C2805
1
3
IC2801
2
1
3
IC2802
2
R2804
R2805
TNP2AA025 Ⓣ①
SEE REVERSE FOR ORDER NO.
C2801
C2802
R2801
R2802
D2801
D2802
D2803
D2804
D2805
D2806
D2807
D2808
S1
S2
S3
S4
COLD
T2801
HOT
P1
P2
T
T1
1
2
J
I
H
G
F
E
D
C
B
A
1
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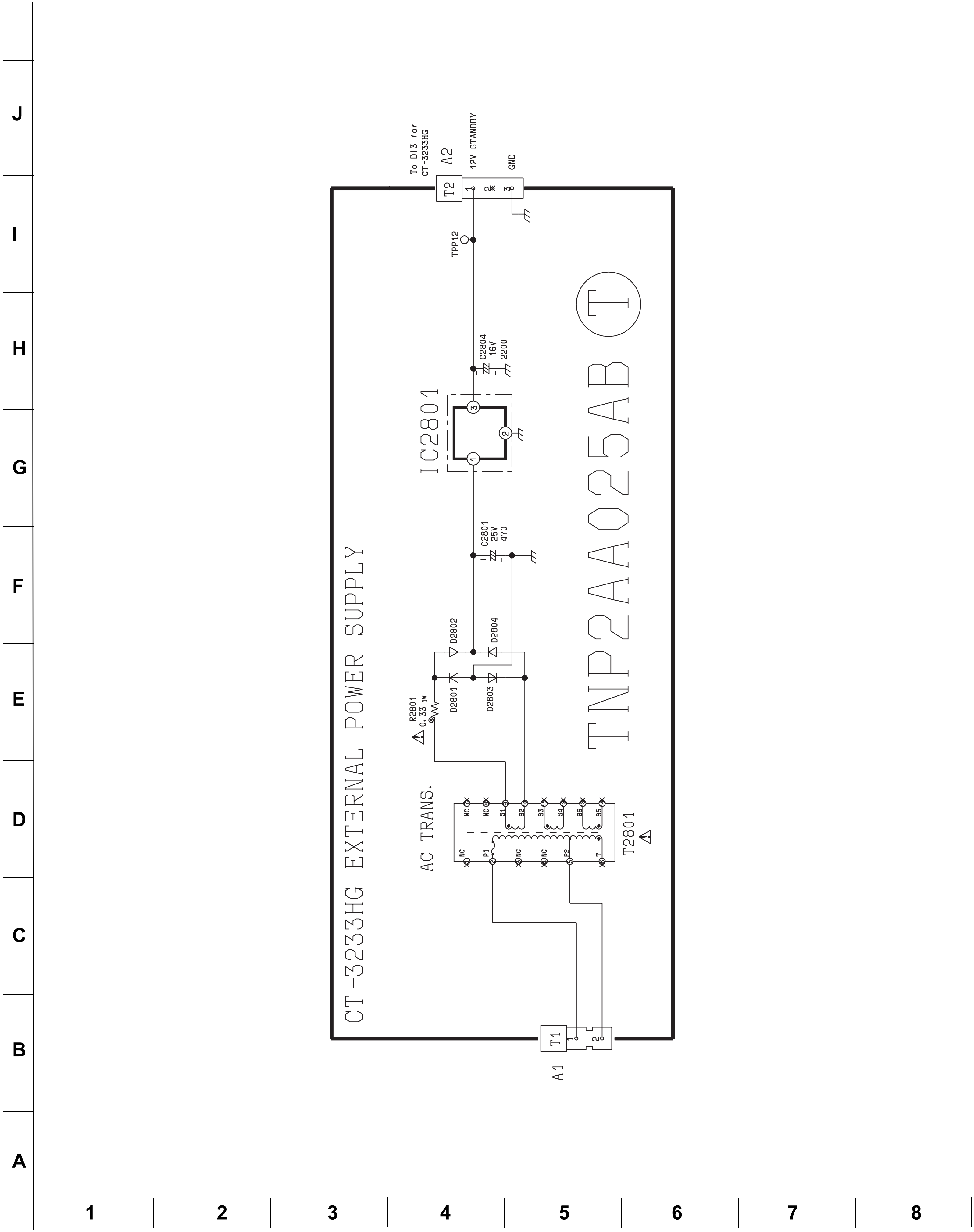
8

J
I
H
G
F
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D
C
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A
1
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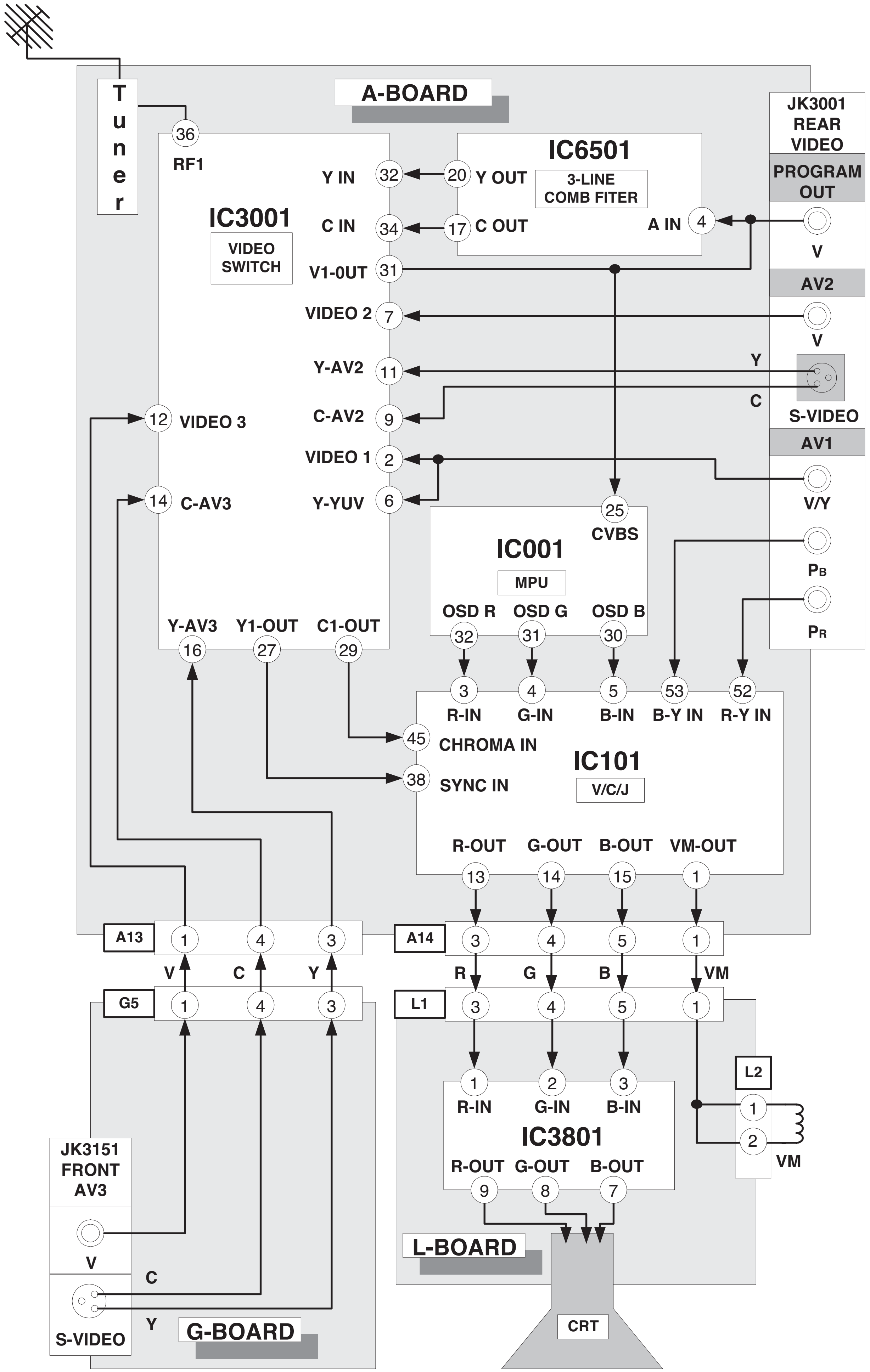
7
8
CT-3233HG EXTERNAL POWER SUPPLY
TNP2AA025AB
T
To DI3 for CT-3233HG
A2
T2
12V STANDBY
GND
1
2
3
TPP12
C2804 16V 2200
IC2801
1
2
3
C2801 25V 470
D2802
D2804
D2801
D2803
R2801 0.33 1W
AC TRANS.
T2801
NC
NC
S1
S2
S3
S4
S6
S5
NC
P1
NC
NC
P2
T
T1
1
2
A1


A-BOARD
Tuner
36
RF1
IC3001
VIDEO SWITCH
Y IN
32
C IN
34
V1-0UT
31
VIDEO 2
7
Y-AV2
11
C-AV2
9
VIDEO 1
2
Y-YUV
6
12
VIDEO 3
14
C-AV3
Y-AV3
16
Y1-OUT
27
C1-OUT
29
IC6501
20
Y OUT
17
C OUT
3-LINE COMB FITER
A IN
4
JK3001 REAR VIDEO
PROGRAM OUT
V
AV2
V
Y
C
S-VIDEO
AV1
V/Y
PB
PR
IC001
MPU
25
CVBS
OSD R
32
OSD G
31
OSD B
30
IC101
V/C/J
3
R-IN
4
G-IN
5
B-IN
53
B-Y IN
52
R-Y IN
45
CHROMA IN
38
SYNC IN
R-OUT
13
G-OUT
14
B-OUT
15
VM-OUT
1
A13
1
4
3
V
C
Y
G5
1
4
3
A14
3
4
5
1
R
G
B
VM
L1
3
4
5
1
IC3801
1
R-IN
2
G-IN
3
B-IN
R-OUT
9
G-OUT
8
B-OUT
7
L2
1
2
VM
L-BOARD
CRT
JK3151 FRONT AV3
V
C
Y
S-VIDEO
G-BOARD

VIDEO BLOCK DIAGRAM CT-3233HG

A-BOARD - TNP2AH054

IC001

1	0.00	22	2.20
2	4.80	23	2.40
3	4.80	24	0.10
4	1.70	25	1.50
5	1.80	26	2.40
6	3.30	27	2.80
7	1.50	28	0.00
8	3.30	29	0.00
9	0.60	30	0.10
10	1.60	31	0.10
11	0.00	32	0.10
12	3.30	33	0.00
13	1.70	34	3.30
14	0.70	35	3.40
15	3.20	36	3.30
16	0.00	37	3.80
17	0.00	38	3.80
18	3.20	39	3.30
19	1.30	40	1.70
20	3.30	41	1.70
21	1.40	42	0.00

IC101

1	4.00	29	3.80
2	0.00	30	3.80
3	3.30	31	0.00
4	3.30	32	0.10
5	3.30	33	4.70
6	0.00	34	1.00
7	6.10	35	1.90
8	5.80	36	0.30
9	5.20	37	8.90
10	0.00	38	3.10
11	5.90	39	6.10
12	4.50	40	7.40
13	2.50	41	5.80
14	2.50	42	5.00
15	2.50	43	1.10
16	8.70	44	0.00
17	4.70	45	1.80
18	4.60	46	1.60
19	4.40	47	2.30
20	2.30	48	2.30
21	2.20	49	3.90
22	4.40	50	3.40
23	0.70	51	5.00
24	0.70	52	3.00
25	5.20	53	3.10
26	2.10	54	3.80
27	4.40	55	2.90
28	5.10	56	3.20

IC2331

1	4.50
2	4.50
3	4.50
4	0.00
5	4.50
6	4.50
7	4.50
8	8.90

IC2451

1	0.00
2	1.10
3	1.30
4	4.50
5	4.50
6	4.50
7	4.50
8	4.50
9	4.50
10	4.50
11	4.50
12	4.50
13	0.00
14	1.60
15	8.90
16	8.90
17	4.80
18	4.70
19	1.90
20	0.00
21	4.50
22	4.50
23	4.50
24	4.50
25	4.50
26	4.50
27	4.50
28	4.50
29	4.50
30	4.50
31	3.50
32	4.50

IC3001

1	8.90
2	3.50
3	4.60
4	4.60
5	4.60
6	3.50
7	3.50
8	4.60
9	4.60
10	4.60
11	3.50
12	3.50
13	4.60
14	4.60
15	4.60
16	3.50
17	4.80
18	4.80
19	0.00
20	0.00
21	4.10
22	3.30
23	3.90
24	3.90
25	3.90
26	3.20
27	3.20
28	3.90
29	3.90
30	3.90
31	3.60
32	3.90
33	4.60
34	4.60
35	4.60
36	3.90

IC511

1	1.80
2	0.00
3	0.00
4	0.00
5	3.00
6	7.90
7	0.40
8	11.90

IC6501

1	5.00
2	1.40
3	3.10
4	2.40
5	1.80
6	5.00
7	0.00
8	5.00
9	4.70
10	4.80
11	0.00
12	0.00
13	2.50
14	2.10
15	5.00
16	0.00
17	2.50
18	3.10
19	1.80
20	2.40

IC002

1	0.00
2	0.00
3	0.00
4	0.00
5	3.80
6	3.80
7	0.00
8	5.00

IC006

1	0.00
2	0.00
3	0.00
4	3.30
5	3.30

IC005

1	4.90
2	0.00
3	1.30
4	3.30
5	0.00
6	4.90

IC2201

1	0.00	13	3.20
2	0.00	14	2.30
3	0.00	15	3.40
4	2.30	16	3.50
5	2.20	17	0.00
6	0.20	18	3.50
7	5.00	19	3.80
8	2.40	20	0.00
9	2.50	21	2.20
10	0.40	22	2.20
11	2.20	23	0.00
12	2.90	24	0.00

IC2301

1	0.00
2	0.00
3	30.70
4	0.00
5	0.00
6	0.00
7	15.40
8	0.60
9	0.00
10	32.00
11	32.00
12	15.50

IC881

1	9.20
2	0.00
3	5.00

IC451

1	1.40
2	14.50
3	-12.60
4	-14.60
5	0.00
6	14.60
7	1.40

IC882

1	14.10
2	0.00
3	8.90

IC883

1	14.90
2	11.90
3	0.00
4	2.50

A-BOARD - TNP2AH054

	Q002	Q009	Q201	Q2302	Q2331	Q2332	Q2333	Q2334	Q2335	Q2336	Q303
B	5.60	0.30	3.30	-0.10	0.00	0.00	-1.30	-1.20	13.60	0.60	3.60
C	10.10	2.10	5.00	0.60	13.60	-1.00	0.00	0.00	-0.10	0.00	5.00
E	5.50	0.00	2.60	0.00	0.10	-0.10	0.00	0.00	12.80	0.00	3.00

	Q3050	Q402	Q453	Q480	Q515	Q563	Q603	Q611	Q6501	Q6502	Q6510
B	-1.50	0.60	0.70	14.60	0.10	8.50	1.10	0.00	3.00	1.30	2.40
C	8.90	3.50	0.00	0.00	2.80	11.90	5.00	0.00	5.00	0.30	0.00
E	0.00	0.00	0.00	14.90	0.00	7.90	1.00	0.70	2.30	2.00	3.00

	Q6511	Q6512	Q6519	Q701	Q702	Q881	Q882	Q883	Q901
B	3.10	3.00	2.50	0.60	4.40	-2.00	0.00	13.60	4.10
C	5.00	5.00	3.10	4.40	0.00	11.90	-1.70	-8.90	7.60
E	2.40	2.40	1.80	0.00	5.00	0.00	-1.70	12.70	3.50

D-BOARD - TNP2AH055

IC1551			
1	0.00	12	7.20
2	0.00	13	3.60
3	2.80	14	11.90
4	11.90	15	11.50
5	6.80	16	5.50
6	6.00	17	0.00
7	8.60	18	7.50
8	2.80	19	3.90
9	10.70	20	4.60
10	11.90	21	0.60
11	7.20	22	4.60

IC750	
1	3.40
2	4.90
3	4.90
4	0.00
5	4.60
6	3.40
7	7.10
8	8.90

IC801↓	
1	1.60
2	0.30
3	0.20
4	0.00
5	0.00
6	4.10
7	15.40
8	2.10
9	5.90

IC802	
1	139.00
2	11.80
3	0.00

IC811	
1	13.00
2	11.90
3 ↓	0.20
4 ↓	5.70

D-BOARD - TNP2AH055

	Q1551	Q1552	Q1553	Q1554	Q1555	Q501	Q551	Q552
B	-0.10	0.50	0.60	4.10	17.00	0.40	0.00	0.00
C	13.60	1.20	6.40	16.40	117.00	92.20	14.50	8.10
E	0.00	0.00	0.00	3.60	16.00	0.00	0.00	0.00

	Q553	Q754	Q802	Q803	Q804	Q854
B	0.00	-0.20	0.70	0.00	15.00	140.00
C	2.00	4.60	0.10	14.90	0.00	0.00
E	0.00	3.60	0.00	0.00	15.10	140.00

	Q751	Q801↓
D	20.00	0.00
G	7.00	0.00
S	0.00	0.00

DI-BOARD - TNP2AA125AA

IC1001			
1	4.10	8	0.60
2	4.10	9	0.60
3	4.10	10	0.60
4	3.90	11	3.90
5	0.10	12	0.10
6	13.70	13	13.70
7	0.00	14	13.70

DI-BOARD - TNP2AA125AA

	Q1001	Q1002	Q1003	Q1004	Q1005	Q1006
B	0.10	0.60	0.70	0.10	0.00	4.80
C	3.30	0.10	0.10	13.70	05.00	5.00
E	0.00	0.00	0.00	0.00	0.00	4.10

	Q1007	Q1008	Q1009	Q1010	Q1011
B	0.00	0.70	0.00	0.00	0.70
C	1.10	0.00	4.80	1.30	0.00
E	0.00	0.00	0.00	0.00	0.00

G - BOARD - TNPA1670AF

IC5001

1	6.30	6	4.20
2	6.80	7	8.90
3	8.90	8	4.20
4	6.80	9	0.00
5	0.00	10	3.60

IC5002

1	0.00	8	6.80
2	0.00	9	4.50
3	0.00	10	4.50
4	11.90	11	0.00
5	2.10	12	2.70
6	2.10	13	2.70
7	2.10	14	4.20

G-BOARD - TNPA1670AF

	Q1051
B	0.60
C	0.00
E	0.00

L-BOARD - TNP2A1673AF

IC3801

1	1.80
2	1.80
3	1.80
4	0.00
5	1.90
6	213.70
7	135.90
8	139.70

L-BOARD - TNP2A1673AF

	Q3802	Q951	Q952	Q953	Q954	Q955
B	11.90	6.90	1.40	6.60	5.30	138.80
C	-1.00	11.90	5.90	11.90	0.00	69.50
E	11.80	6.20	0.70	6.00	5.90	138.80

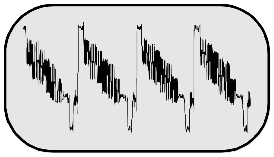
	Q956	Q957	Q958	Q961	Q962
B	0.80	5.90	5.90	0.10	7.60
C	69.60	0.00	11.90	0.00	11.90
E	0.30	6.60	5.30	0.00	6.90

T-BOARD - TNP2AA025AB

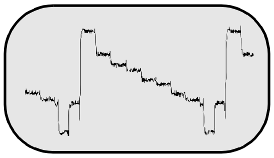
IC2801

1	23.80
2	0.00
3	11.10

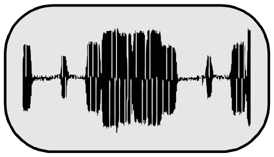
A-Board TNP2AH054



① **0.90V p-p**
IC3001 PIN 36
(Main Video)



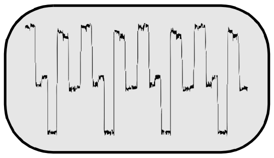
② **0.90V p-p**
IC3001 PIN 32
Y_IN



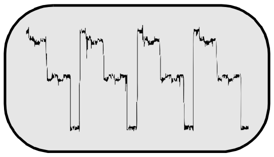
③ **0.60V p-p**
IC3001 PIN 34
C_IN

3.57MHz

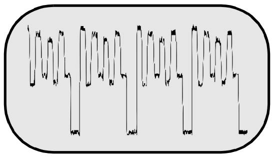
④ X'TAL
IC101 PIN 49



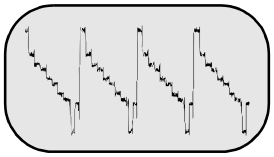
⑤ **3.72V p-p**
IC101 PIN 13
(R_OUT)



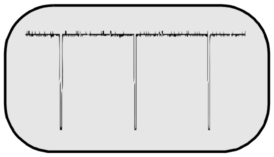
⑥ **3.20V p-p**
IC101 PIN 14
(G_OUT)



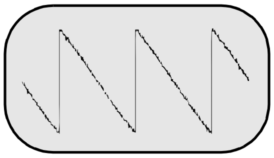
⑦ **3.50V p-p**
IC101 PIN 15
(B_OUT)



⑧ **0.90V p-p**
IC101 PIN 38
(SYNC IN)



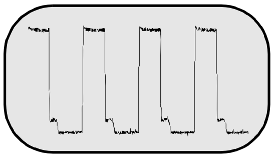
⑨ **5.20V p-p**
IC101 PIN 33
(VD_OUT)



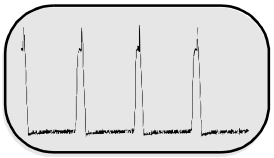
⑩ **1.70V p-p**
IC101 PIN 25
(V_NFB)

507 KHz

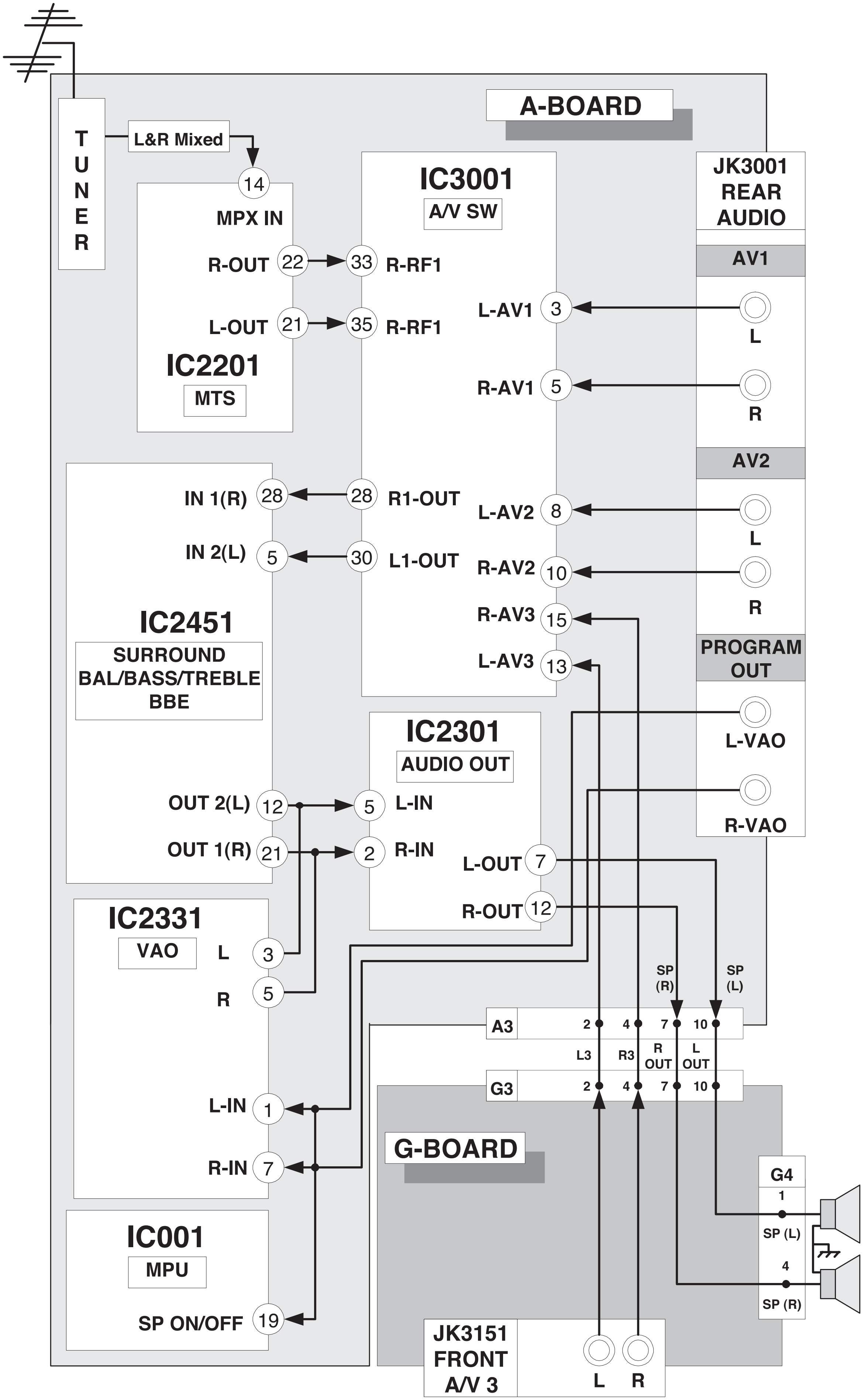
⑪ X'TAL
IC101 PIN 41



⑫ **4.96V p-p**
IC101 PIN 35
(H_OUT)

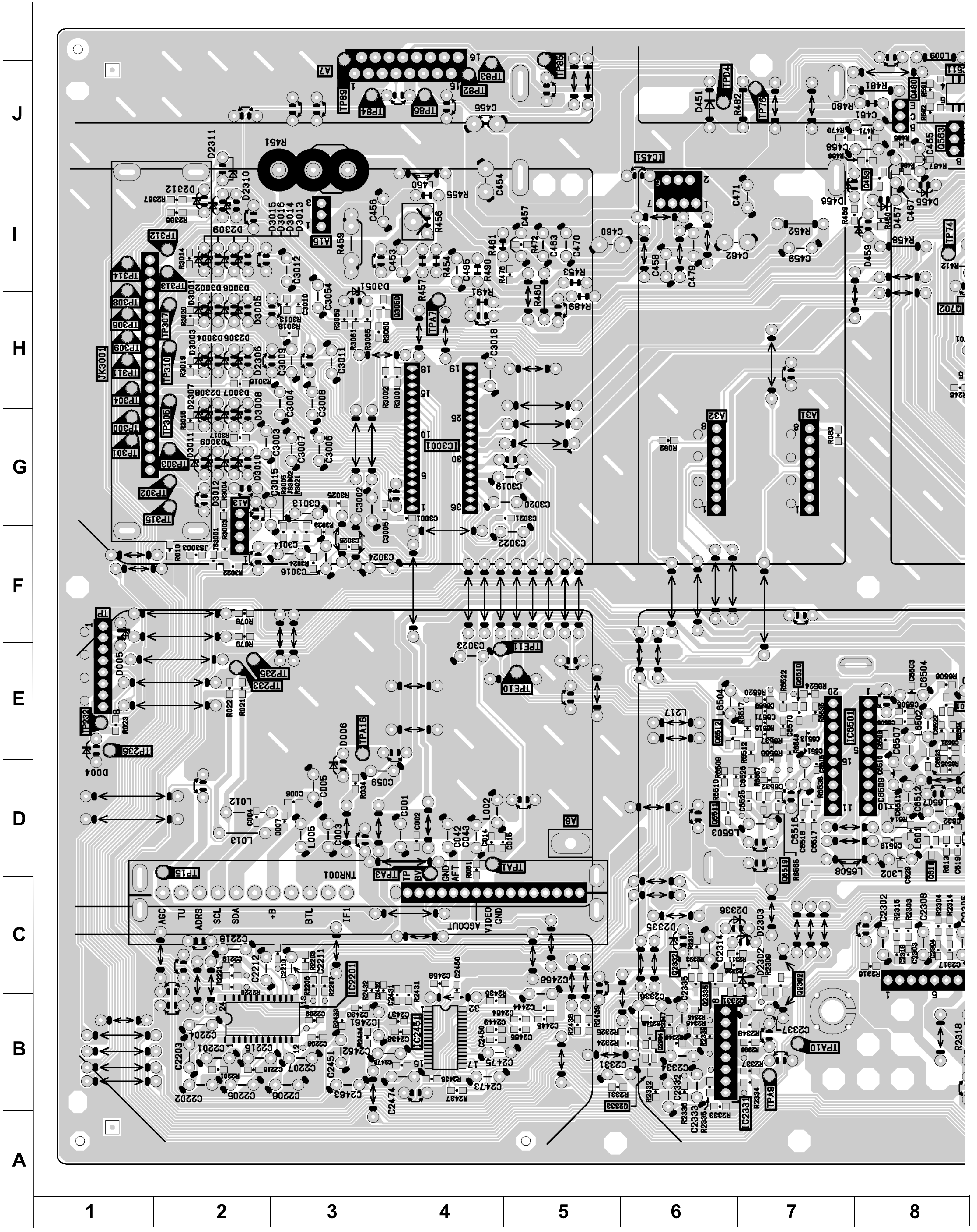


⑬ **6.70V p-p**
IC101 PIN 34
(FBP_IN)



A-BOARD
TUNER
L&R Mixed
14
MPX IN
R-OUT
22
L-OUT
21
IC2201
MTS
IC3001
A/V SW
33
R-RF1
35
R-RF1
L-AV1
3
R-AV1
5
JK3001
REAR
AUDIO
AV1
L
R
AV2
L
R
PROGRAM
OUT
L-VAO
R-VAO
IN 1(R)
28
28
R1-OUT
IN 2(L)
5
30
L1-OUT
L-AV2
8
R-AV2
10
R-AV3
15
L-AV3
13
IC2451
SURROUND
BAL/BASS/TREBLE
BBE
IC2301
AUDIO OUT
OUT 2(L)
12
5
L-IN
OUT 1(R)
21
2
R-IN
L-OUT
7
R-OUT
12
IC2331
VAO
L
3
R
5
L-IN
1
R-IN
7
IC001
MPU
SP ON/OFF
19
SP (R)
SP (L)
A3
2
4
7
10
L3
R3
R OUT
L OUT
G3
2
4
7
10
G-BOARD
G4
1
SP (L)
4
SP (R)
JK3151
FRONT
A/V 3
L
R

AUDIO BLOCK DIAGRAM CT-3233HG



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TP82
TP83
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C455
R451
D2311
D2310
D2312
L450
R455
C454
C456
R456
R459
A15
IC451
C471
C462
TPD4
D451
R482
TP76
R481
R480
C461
Q480
Q563
C468
D453
D456
D455
D457
C467
R452
C459
TP74
D459
R458
JK3001
TP312
TP314
TP313
TP308
TP306
TP307
TP309
TP310
TP311
TP304
TP305
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TP301
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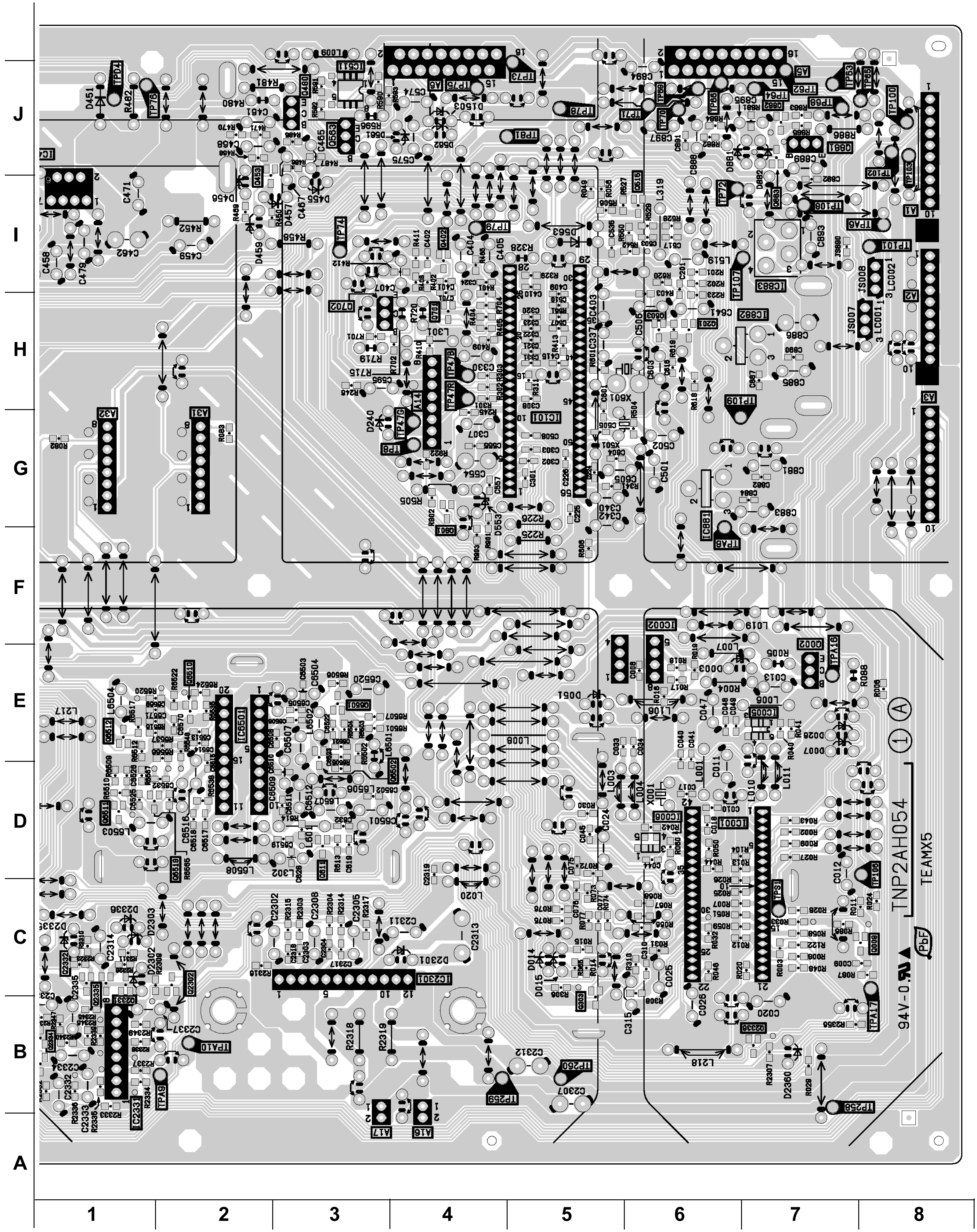
TP302
TP315
A13
IC3001
Q3060
TPA7
C3018
C3019
C3020
C3022
C3023
TPE11
TPE10
A32
A31
R082
R083
TP
D005
TP235
TP233
TP232
TP236
D004
D006
TPA18
L012
L013
L005
L002
C059
C003
C001
C002
C042
C043
C014
C015
AS
TP15
TPA3
TPA1
TNR001
AGC
TU
ADRS
SCL
SDA
+B
BTL
IF1
TP
BV
GND
AFT
AGCOUT
VIDEO
GND
IC2201
C2218
C2212
C2211
C2204
C2203
C2201
C2215
C2207
C2202
C2205
C2206
C2451
IC2451
C2461
C2462
C2463
C2474
C2473
C2475
C2468
L217
IC6501
Q6510
Q6512
Q6511
L6504
L6503
L6502
C6504
L601
L6508
L302
Q6519
Q611
D2335
D2336
D2303
D2302
C2314
Q2332
Q2335
Q2302
IC2331
C2337
TPA10
TPA9
C2331
C2332
C2334
C2336
Q2333
C2302
C2308
R2318

A-BOARD 1/2 TNP2AH054 CT-3233HG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TNP2AH054
TEAMX5
94V-0
PbF
IC101
IC2301
IC6501
IC001
IC002
IC005
IC006
IC881
IC882
IC883
IC2331
IC511
A1
A2
A3
A5
A6
A14
A16
A17
A31
A32
X601
X001
L319
L519
L001
L003
L004
L006
L007
L008
L010
L011
L019
L020
L106
L217
L218
L301
L302
L601
L6501
L6502
L6503
L6504
L6506
L6507
L6508
JS007
JS008
LC001
LC002

A-BOARD 2/2 TNP2AH054 CT-3233HG

ORDER NO. MTNC010524C1
B5

Service Manual

Color Television

Main Manual

(NA8ML)

Panasonic

Models	Chassis
CT-32SX31E	**BP371**
CT-32SX31UE	**BP371**
CT-32SX31CE	**BP371**
CT-36SX31E	**BP372**
CT-36SX31UE	**BP372**
CT-36SX31CE	**BP372**

This Service manual is issued as a service guide for the models of the **NA8ML** family listed above. Included in this manual are a set of schematic, block diagrams, functional descriptions, alignment procedures, disassembly procedures and a complete parts list.

“**WARNING!** This Service Manual is designed for experienced repair technicians only and is not designed for use by the general public. It does not contain warnings or cautions to advise non-technical individuals of potential dangers in attempting to service a product. **Products powered by electricity should be serviced or repaired only by experienced professional technicians.** Any attempt to service or repair the product or products dealt with in this Service Manual by anyone else could result in serious injury or death.”

The service technician is required to read and follow the “**Safety Precautions**” and “**Important Safety Notice**” in this Main Manual.

Panasonic®

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Important Safety Notice

Special components are used in this television set which are important for safety. These parts are identified on the schematic diagram by the symbol ⚠ and printed in **BOLD TYPE** on the replacement part list. It is essential that these critical parts are replaced with the manufacturer's specified replacement part to prevent X-ray radiation, shock, fire or other hazards. Do not modify the original design without the manufacturer's permission.

Safety Precautions

General Guidelines

An **Isolation Transformer** should always be used during the servicing of a receiver whose chassis is not isolated from AC power line. Use a transformer of adequate power rating as this protects the technician from accidents resulting in personal injury from electrical shocks. It will also protect the Receiver from being damaged by accidental shorting that may occur during servicing.

When servicing, observe the original lead dress, especially in the high voltage circuit. Replace all damaged parts (also parts that show signs of overheating.)

Always Replace Protective Devices, such as fishpaper, isolation resistors and capacitors, and shields after servicing the Receiver. Use only manufacturer's recommended rating for fuses, circuits breakers, etc.

High potentials are present when this Receiver is operating. Operation of the Receiver without the rear cover introduces danger for electrical shock. Servicing should not be performed by anyone who is not thoroughly familiar with the necessary precautions when servicing high-voltage equipment.

Extreme care should be practiced when **Handling the Picture Tube**. Rough handling may cause it to implode due to atmospheric pressure. (14.7 lbs per sq. in.). Do not nick or scratch the glass or subject it to any undue pressure. When handling, use safety goggles and heavy gloves for protection. **Discharge the picture tube** by shorting the anode to chassis ground (not to the cabinet or to other mounting hardware). When discharging connect cold ground (i.e. dag ground lead) to the anode with a well insulated wire or use a grounding probe.

Avoid prolonged exposure at close range to unshielded areas of the picture tube to prevent exposure to X-ray radiation.

The **Test Picture Tube** used for servicing the chassis at the bench should incorporate safety glass and magnetic shielding. The safety glass provide shielding for the tube viewing area against X-ray radiation as well as implosion. The magnetic shield limits the X-ray radiation around the bell of the picture tube in addition to the restricting magnetic effects. When using a picture tube test jig for service, ensure that the jig is capable of handling **40kV** without causing X-ray radiation.

Before returning a serviced receiver to the owner, the service technician must thoroughly test the unit to ensure that is completely safe to operate. **Do not use a line isolation transformer when testing.**

Leakage Current Cold Check

Unplug the AC cord and connect a jumper between the two plug prongs.

Measure the resistance between the jumpered AC plug and expose metallic parts such as screwheads, antenna terminals, control shafts, etc. If the exposed metallic part has a return path to the chassis, the reading should be between 240kΩ and 5.2MΩ. If the exposed metallic part does not have a return path to the chassis, the reading should be infinite.

Leakage Current Hot Check (Fig. 1)

Plug the AC cord directly into the AC outlet. Do not use an isolation transformer during the check.

Connect a 1.5kΩ 10 watt resistor in parallel with a 0.15µF capacitor between an exposed metallic part and ground. Use earth ground, for example a water pipe.

Using a DVM with a 1000 ohms/volt sensitivity or higher, measure the AC potential across the resistor.

Repeat the procedure and measure the voltage present with all other exposed metallic parts.

Verify that any potential does not exceed 0.75 volt RMS. A leakage current tester (such a Simpson Model 229, Sencore Model PR57 or equivalent) may be used in the above procedure, in which case any current measure must not exceed 0.5 milliamp. If any measurement is out of the specified limits, there is a possibility of a shock hazard and the Receiver must be repaired and rechecked before it is returned to the customer.

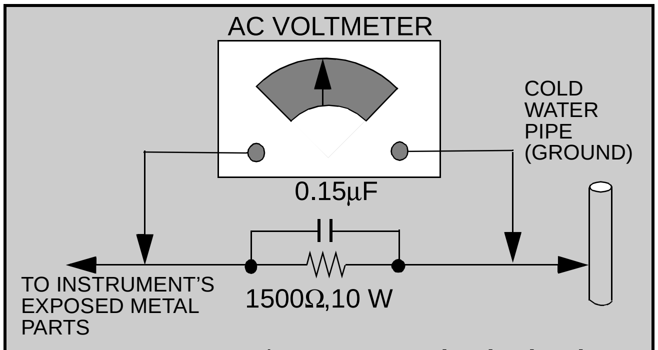


Figure 1. **Hot Check Circuit**

X-ray Radiation

WARNING: The potential source of X-ray radiation in the TV set is in the High Voltage section and the picture tube.

Note: *It is important to use an accurate, calibrated high voltage meter.*

Set the **brightness, picture, sharpness** and **color** controls to Minimum. Measure the High Voltage. The high voltage should be **31.0 ± 1.0kV**. If the upper limit is out of tolerance, immediate service and correction is required to insure safe operation and to prevent the possibility of premature component failure.

Horizontal Oscillator Disable Circuit Test

This test must be performed as a final check before the Receiver is returned to the customer. See Horizontal **Oscillator Disable Circuit Procedure Check** in this manual.

Table of Contents

Important Safety Notice 2

Safety Precautions 2
General Guidelines. 2
Leakage Current Cold Check 2
X-ray Radiation. 2
Horizontal Oscillator
Disable Circuit Test 2

Service Notes. 4

Leadless Chip Component
(surface mount) 4
Component Removal 4
Chip Component Installation 4
How to Replace Flat-IC 4
Horizontal Oscillator Disable Circuit 5

SPECIFICATIONS

Receiver Feature Table 6

OPERATION

Location of Controls (Receiver). 7

Quick Reference Control Operation 7
Quick Reference. 7
Control Operation 7

Location of Controls (Remote). 8

SERVICE

Disassembly for Service. 9

Back Cover. 9
A-Board - Main Chassis 9
L-Board - CRT Output 9
Speakers 9
Keyboard Push Button Assembly. 9
Disassembly for CRT Replacement 9
CRT Replacement 9
Back Cover Removal 11

Chassis Service Adjustment Procedures . . . 12

140.0V B+ Voltage Confirmation 12
Source Voltage Chart. 12
High Voltage Check 12

Purity and Convergence Procedure 13

When the CRT or the Yoke is Replaced 13
Initial Center Static Convergence. 14
Purity Adjustment 14
Dynamic Corvergence Adjustment. . . . 14
DY(YHC, YV, XV) Adjustment 14
Permalloy Convergence Corrector
Strip (Part No. 0FMK014ZZ). 15
DAF Adjustment 15

Serviceman Mode (Electronic Controls) 17

Exiting the Serviceman Mode. 17
Entering Serviceman
Mode (Back-Open Method) 23

**Instructional Flow Chart for
Serviceman Mode 24**

**Service Adjustments
(Electronic Controls). 27**

Sub-Contrast Adjustment 27
Sub-Brightness (B02) 27
Tint/Color Adjustment. 27
PIP Sub-Contrast Adjustment (P03). . . 28
Color Temperature Adjustment. 28
Complete Adjustment 28
Horizontal Centering (D00). 29
E-W PCC Adjustment (D0C). 29
Corner PCC Adjustment (D0B). 29
H-Size Adjustment (D0D) 29
V-Size and V-Position Adjustment
(D01 & D06) 29
V-Linearity Adjustment (D03) 29
V-Correction Adjustment (D02). 30
MTS Circuit Adjustments 30
Input Level Adjustment (M00). 30
Stereo Separation Adjustment
(M01 & M02) 30
Clock Adjustment (S07) 31
Service Adjustments
(Mechanical Controls) 31
Focus (part of T551) 31

CIRCUITS & BLOCK DIAGRAMS

Audio Signal Path Block Diagram 32

Video Signal Path Block Diagram 33

IIC Connection 34

Description of Connectors 35

IC101 IN/OUT Pins and Functions (VCJ) 36

Component Identification 37

Parts List 40

FOLDOUTS

Schematics, Voltages and waveforms

L-Board Voltages,
PCB & schematics 53
A-Board (Left Portion) 54
A-Board (Right Portion). 55
A-Board PCB. 56
A-Board Voltages 57
D-Board schematics 58
D-Board PCB & voltages. 59
G-Board schematics 60
G-Board PCB & voltages 61
A-Board Waveforms 62

Service Notes

Note: ***These components are affixed with glue. Be careful not to break or damage any foil under the component or at the pins of the ICs when removing. Usually applying heat to the component for a short time while twisting with tweezers will break the component loose.***

Leadless Chip Component (surface mount)

Chip components must be replaced with identical chips due to critical foil track spacing. There are no holes in the board to mount standard transistors or diodes. Some chips capacitor or resistor board solder pads may have holes through the board, however the hole diameter limits standard resistor replacement to 1/8 watt. Standard capacitor may also be limited for the same reason. It is recommended that identical components be used.

Chip resistor have a three digit numerical resistance code - 1st and 2nd significant digits and a multiplier. Example: 162 = 1600 or 1.6kΩ resistor, 0 = 0Ω (jumper).

Chip capacitors generally do not have the value indicated on the capacitor. The color of the component indicates the general range of the capacitance.

Chip transistors are identified by a two letter code. The first letter indicates the type and the second letter, the grade of transistor.

Chip diodes have a two letter identification code as per the code chart and are a dual diode pack with either common anode or common cathode. Check the parts list for correct diode number.

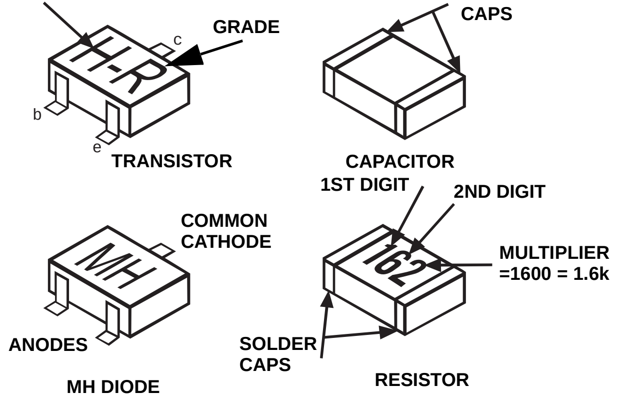
Component Removal

1. Use solder wick to remove solder from component end caps or terminal.
2. Without pulling up, carefully twist the component with tweezers to break the adhesive.
3. Do not reuse removed leadless or chip components since they are subject to stress fracture during removal.

Chip Component Installation

1. Put a small amount of solder on the board soldering pads.
2. Hold the chip component against the soldering pads with tweezers or with a miniature alligator clip and apply heat to the pad area with a 30 watt iron until solder flows. Do not apply heat for more than 3 seconds.

Chip Components



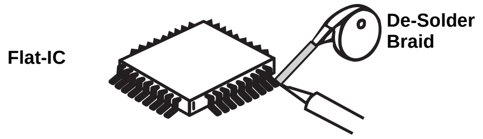
TYPE
GRADE
H-R
c
b
e
TRANSISTOR
SOLDER CAPS
CAPACITOR
1ST DIGIT
2ND DIGIT
COMMON CATHODE
MH
162
MULTIPLIER =1600 = 1.6k
ANODES
SOLDER CAPS
MH DIODE
RESISTOR

How to Replace Flat-IC

- Required Tools -

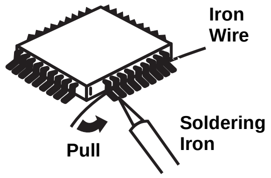
- Soldering iron
- Iron wire or small awl
- De-solder braids
- Magnifier

1. Remove the solder from all of the pins of a Flat-IC by using a de-solder braid.

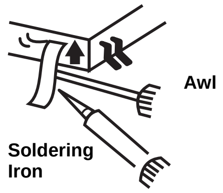


Flat-IC
De-Solder Braid

2. Put the iron wire under the pins of the Flat-IC and pull it in the direction indicated while heating the pins using a soldering iron. A small awl can be used instead of the iron wire.

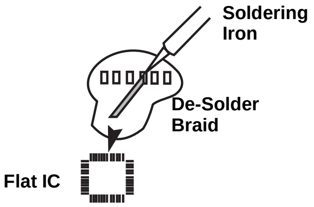


Iron Wire
Pull
Soldering Iron



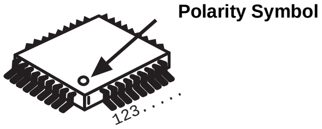
Awl
Soldering Iron

3. Remove the solder from all the pads of the Flat-IC by using a de-solder braid.



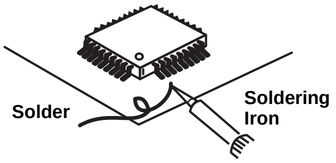
Soldering Iron
De-Solder Braid
Flat IC

4. Position the new Flat-IC in place (apply the pins of the Flat-IC to the soldering pads where the pins need to be soldered). Properly determine the positions of the soldering pads and pins by correctly aligning the polarity symbol.



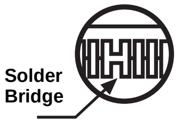
Polarity Symbol
123.....

5. Solder all pins to the soldering pads using a fine tipped soldering iron.

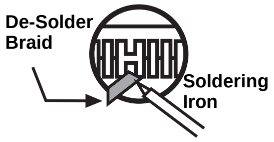


Solder
Soldering Iron

6. Check with a magnifier for solder bridge between the pins or for dry joint between pins and soldering pads. To remove a solder bridge, use a de-solder braid as shown in the figure below.



Solder Bridge



De-Solder Braid
Soldering Iron

Service Notes (Continued)

IMPORTANT: To protect against possible damage to the solid state devices due to arcing or static discharge, make certain that all ground wires and CTR DAG wire are securely connected.

CAUTION: The power supply circuit is above earth ground and the chassis cannot be polarized. Use an isolation transformer when servicing the Receiver to avoid damage to the test equipment or to the chassis. Connect the test equipment to the proper ground ⏚ () or (⏚) when servicing, or incorrect voltages will be measured.

WARNING: This Receiver has been designed to meet or exceed applicable safety and X-ray radiation protection as specified by government agencies and independent testing laboratories.

To maintain original product safety design standards relative to X-ray radiation and shock and fire hazard, parts indicated with the symbol ⚠ on the schematic must be replaced with identical parts. Order parts from the manufacturer's parts center using the parts numbers shown in this service manual, or provide the chassis number and the part reference number.

For optimum performance and reliability, all other parts should be replaced with components of identical specification.

Horizontal Oscillator Disable Circuit

This chassis employs a special circuit to protect against excessive high voltage and beam current. If, for any reason, the high voltage and beam current exceed a predetermined level this protective circuit activates and detunes the horizontal oscillator that limits the high voltage. The over-voltage protection circuit is not adjustable. However, if components indicated by the symbol ⚠ on the schematic in either the horizontal sweep system or the over-voltage protection circuit itself are changed, the operation of the circuit should be checked using the following procedure:

Equipment needed to check the disabled circuit:

1. DC Ammeter
2. High Voltage Meter (0- 50kV electrostatic)
3. Variac or Isolation Transformer
4. HHS Jig (See Fig. 2)

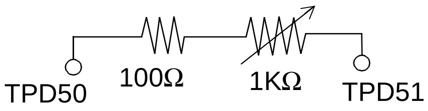


Figure 2. **HHS Jig**

Preparation

1. Connect Receiver to AC 120 Volts. Do not turn ON.
2. Connect HIGH VOLTAGE meter to 2nd anode (H.V. button). ***Note***: *Use cold ground(⏚) for negative lead.*
3. Connect the ammeter serial from the flyback anode lead to the picture tube anode socket.
4. Prepare HHS jig to be connected between TPD50 and TPD51 as shown in Fig. 2.

Procedure:

1. Open Connector A17.
2. Turn power ON and Apply a monoscope pattern.
3. Set current within 50-100µA by changing the picture and bright controls.
4. Turn power OFF.
5. Connect HHS jig between **TPD50** and **TPD51** (VR should be turn fully clockwise).
6. Turn power on.
7. Turn slowly the variable resistor to increase the current until the horizontal sync frequency abruptly increases indicating that the horizontal frequency is just beginning to pull out of sync. Maintain the current within 50-100µA by changing the picture and bright controls
8. Observe the High Voltage meter. **HIGH VOLTAGE** should read less than **40.2kV**.
9. Turn power OFF, Remove HHS jig, HV meter, ammeter and connect A17 connector.
10. Turn Power ON. Reset Picture and Brightness controls. Confirm **B+ 140V±1.5V** with 120V AC applied.
11. ***IF HIGH VOLTAGE IS NOT WITHIN THE SPECIFIED LIMIT THE CAUSE MUST BE DETERMINED BEFORE THE RECEIVER IS RETURNED TO THE OWNER.***

Receiver Feature Table

FEATURE\MODEL	CT-32SX31E/UE/CE	CT-36SX31E/UE/CE
Chassis	NA8ML	
Tunning system	96K	
# of channels	181	
Menu language	Eng/Span/Fr	
Closed Caption	X	
V-Chip (USA/CANADA)	X	
2RF	X	
Remote Model #	EUR511500	
Picture tube	AMEC	
Comb Filter	3 DIG	
VM	X	
V/A norm	X	
Color Temp	X	
MTS/SAP/DBX	X	
BASS/BL/TRE Control	X	
AI Sound	X	
Surround	X	
SPATIALIZER/BBE	BBE	
Built-in audio power	10W/CH (10%)	
# of speakers	2	
A/V in (rear/front)	3(2/1)	
S-VHS Input (rear/front)	1/1	
Component Input (Y,Pb,Pr)	1	
Audio Out (FAO: F, VAO: V)	F,V	
EPJ/HPJ/MISC	HPJ	
Dimensions (WxDxH) mm in	667.3x810x568 26.52x32.4x22.72	747x936x610.5 29.88x37.44x24.42
Weight (kg/lbs)	74.8/164.56	98.5/216.7
Power source (V/Hz)	120/60	
Anode voltage	31.0kV ± 1.0kV	
Video input jack	$1V_{p-p}$ 75Ω, phono jack	
Audio input jack	500mV RMS 47kΩ	
A-Board TNP2AH026	AB	NIL
G-Board TNPA1670	AC	
L-Board TNPA1673	AB	
D-Board TNP2AH027	AB	NIL

Table 1. **Receiver Features**

Specifications are subject to change without notice or obligation. Dimensions and weights are approximate.

Location of Controls (Receiver)

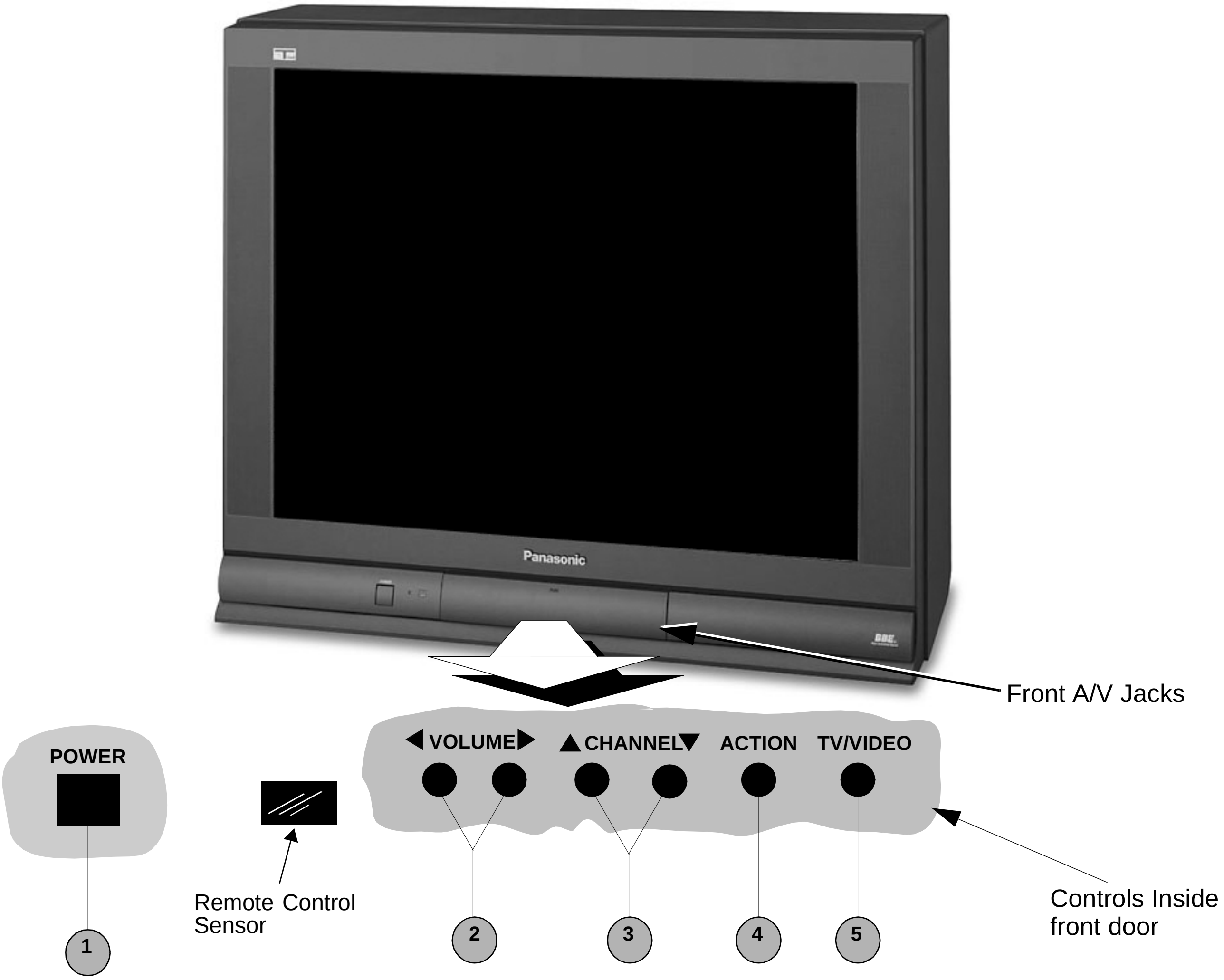

Panasonic
Front A/V Jacks
POWER
VOLUME
CHANNEL
ACTION
TV/VIDEO
Remote Control Sensor
Controls Inside front door
1
2
3
4
5

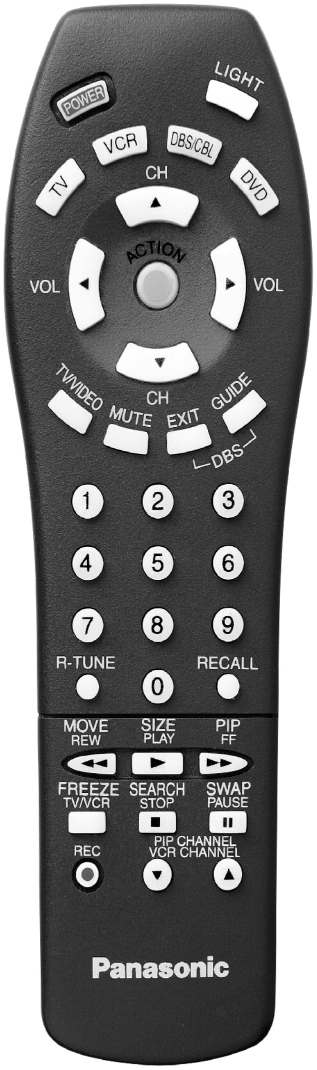
Figure 3. **Location of Controls (Receiver).**

Quick Reference Control Operation

	Quick Reference Control Operation
①	**Power Button -** Press to turn ON or OFF.
②	**Volume Buttons -** Press to adjust Sound Level, or to adjust Audio Menus, Video Menus, and select operating features when menus are displayed
③	**Channel Buttons -** Press to select programmed channels. Press to highlight desired features when menus are displayed. Also use to select Cable Converter box channels after programming Remote Control Infra-red codes (the TV/AUX/CABLE switch must be set in CABLE position).
④	**Action Button -** Press to display Main Menu and access On Screen feature and Adjustment Menus.
⑤	**TV/Video Button -** Press to select TV or Video Input.

Location of Controls (Remote)

POWER Button	Press to turn ON and OFF.
MUTE Button	Press to mute sound. A second press resumes sound. Press also to access and delete Closed Caption display.
VCR, DVD, LD/CD, AUX, TV, CBL, DBS, RCVR	Component function buttons
VOL (volume) Buttons	Press to adjust TV sound level. Use with Channel buttons to navigate in menus.
R-TUNE (Rapid Tune) Button.	Press to switch to the previous channel.
ACTION Button	Press to display Main Menu and access or exit On Screen features and Adjustment Menus.
REW, PLAY, FF, TV/VCR, STOP, PAUSE, REC, VCR CHANNEL	Component function buttons.


LIGHT
POWER
VCR
DBS/CBL
TV
CH
DVD
ACTION
VOL
VOL
TV/VIDEO
CH
MUTE
EXIT
GUIDE
DBS
1
2
3
4
5
6
7
8
9
R-TUNE
0
RECALL
MOVE
REW
SIZE
PLAY
PIP
FF
FREEZE
TV/VCR
SEARCH
STOP
SWAP
PAUSE
REC
PIP CHANNEL
VCR CHANNEL
Panasonic

MULTI Button	Programmable button that can operate up to seven (7) functions at once
TV/VIDEO Button	Press to select TV or Video input.
CH (channel) Buttons	Press to select channels. Use with volume buttons to navigate in menus.
DBS EXIT, DBS GUIDE	DBS function buttons.
RECALL Button	Press to display Time, status of Sleep Timer, Channel, Video mode and Channel Caption (Station Identifier).
OPEN/CLOSE, SLOW, STILL	DVD function buttons.
“0” - “9”	Press numeric keypad to select any channel.

EUR511500

Figure 4. **Location of Controls (Remote).**

Disassembly for Service

Back Cover

Remove all the screws marked with an arrow(⬅) from the back of the Receiver.

Note: *Screw configuration, type, and number of screws vary depending on the model of the Receiver serviced and the application; various models are covered in this Manual. Use same hardware when reassembling the receiver.*

- 4 screws at the top edge of the Receiver.
- 4 screw by the A/V jacks.
- 1 screw by the antenna jacks.
- 1 screw at each lower corner of the Receiver.
- 1 screw by the retainer plate of the AC power cord.

A-Board - Main Chassis

The A-Board assembly rest on a chassis tray along with the D-Board. Slide chassis tray out. Gently lift tray and pull out. Disconnect plug connectors; release wire ties and holders as required for complete chassis removal.

1. A & D-Boards are secured to the chassis tray with five screws.
2. The A-Board is mated to the D-Board by three flexible connectors: A1, A2 & A3 (G1, G2 & G3 on the G-Board, respectively). To remove either boards, unplug the connectors on the A-Board.

Note: *Some tie-wraps that secure the wire dressings may need to be unfastened for chassis removal.*

L-Board - CRT Output

Plugs into the socket on the CRT neck.

To remove this board, first unplug the board from the CRT neck, then disconnect L1, L2 & L3 connectors, to disconnect the focus F1(Red Cable) & F2(White Cable) cables, pull the tab and release the cables, finally disconnect the screen cable from the D-Board Fly-Back.

To reinsert back the cables, remember the original position of cables, F1(red cable) goes to A on the CRT socket and F2(white cable) goes to B on the CRT socket.

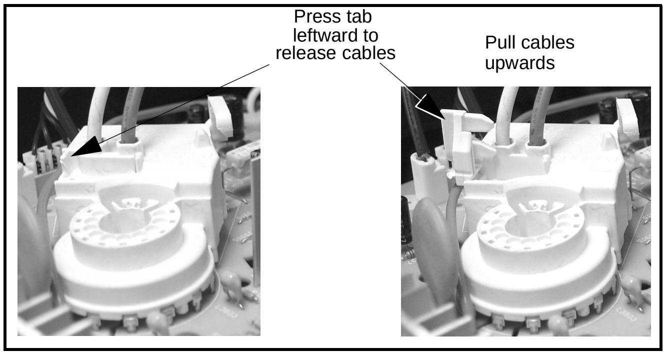


Figure 5. **F1 & F2 cables release**

To release screen GND cables from L-Board L11 & L12 connectors, insert a wire in both sides of connector and pull upwards the cable, then remove the wire (See Fig. 6)

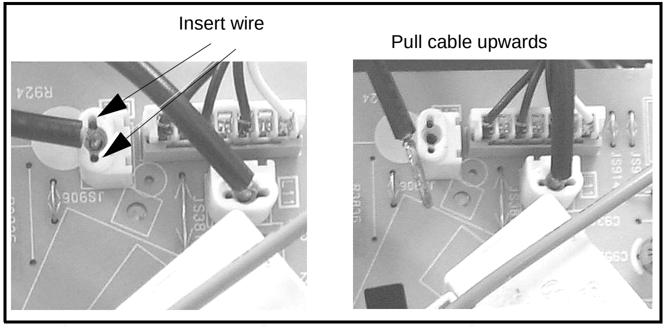


Figure 6. **L-Board Screen GND cables release**

Speakers

Speaker is secured to the cabinet's front with 4 screws.

Keyboard Push Button Assembly

Fastened to the inside of the cabinet front.

Disassembly for CRT Replacement

1. Discharge the CRT as instructed in the **Safety Precautions** (see page 2).
2. Disconnect the yoke (DY) plug, degaussing coil (DEG) plug and the CRT 2nd anode button from the board.
3. Remove the L-Board from the CRT socket and unplug the black wires (CRT dag ground) L11 & L12.
4. Lift the Main Chassis (A-Board) and all mounted boards completely out with the CRT Board attached.

CRT Replacement

1. Perform **Disassembly for CRT Replacement** procedure.
2. Insure that the CRT H.V. Anode button is discharged before handling the CRT. Read the **Safety Precautions** (see page 2) on handling the picture tube.
3. Remove the components from the CRT neck and place the cabinet face down on a soft pad.
4. Note the original order for the CRT mounting hardware as they are remove from the CRT mounting brackets at each corner of the CRT.
5. Remove the CRT with the degaussing coil and the dag ground braid attached.

Note: After servicing the receiver, remember to dress the cables, as shown above.

Disassembly for Service (Continued)

Note: *To remove the four brackets holding the degauss coil from the corners of the CRT, first remove the CRT from the cabinet, then remove the Brackets by pressing the tab on the bracket and pull upwards. These Brackets are included in the Degauss Coil Kit, for part number, please see parts list section (See Fig. 7).*

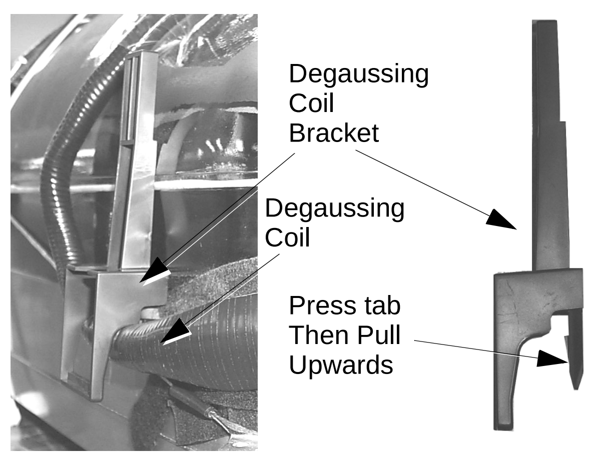


Figure 7. **Brackets removal**

6. Note the original locations and mounting of the degaussing coil and the dag ground assembly to insure proper reinstallation on the replacement CRT.
   To remove and remount the degaussing coil: The degaussing coil is held in place by clampers fastened to the CRT corner ears. These clampers must be installed onto the replacement CRT prior to mounting the degaussing coil.
   To remove and remount the dag ground braid:
   a. Unhook the coil spring from the bottom corners of the CRT ears.
   b. Release the braid loop from the upper corners of the CRT ears.
7. Mount the dag ground braid on the replacement CRT. Position the degaussing coil with new ties. Dress coil as was on the original CRT.
8. Replace the components on CRT neck and reinstall into cabinet. Verify that all ground wires and circuit board plugs get connected.

Note: *Reuse all the clampers and mounting brackets from the degaussing coil and screen, and when remounting the degaussing coil assure that is not touching the speakers, this can be done by placing some tape (See Fig. 7), this may cause mask vibration. The mounting brackets and clampers are not supplied with the replacements.*

Important Notice:

When ordering the CRT, please order CRT and CRT KIT also. Please see parts list section for part numbers

Back Cover Removal

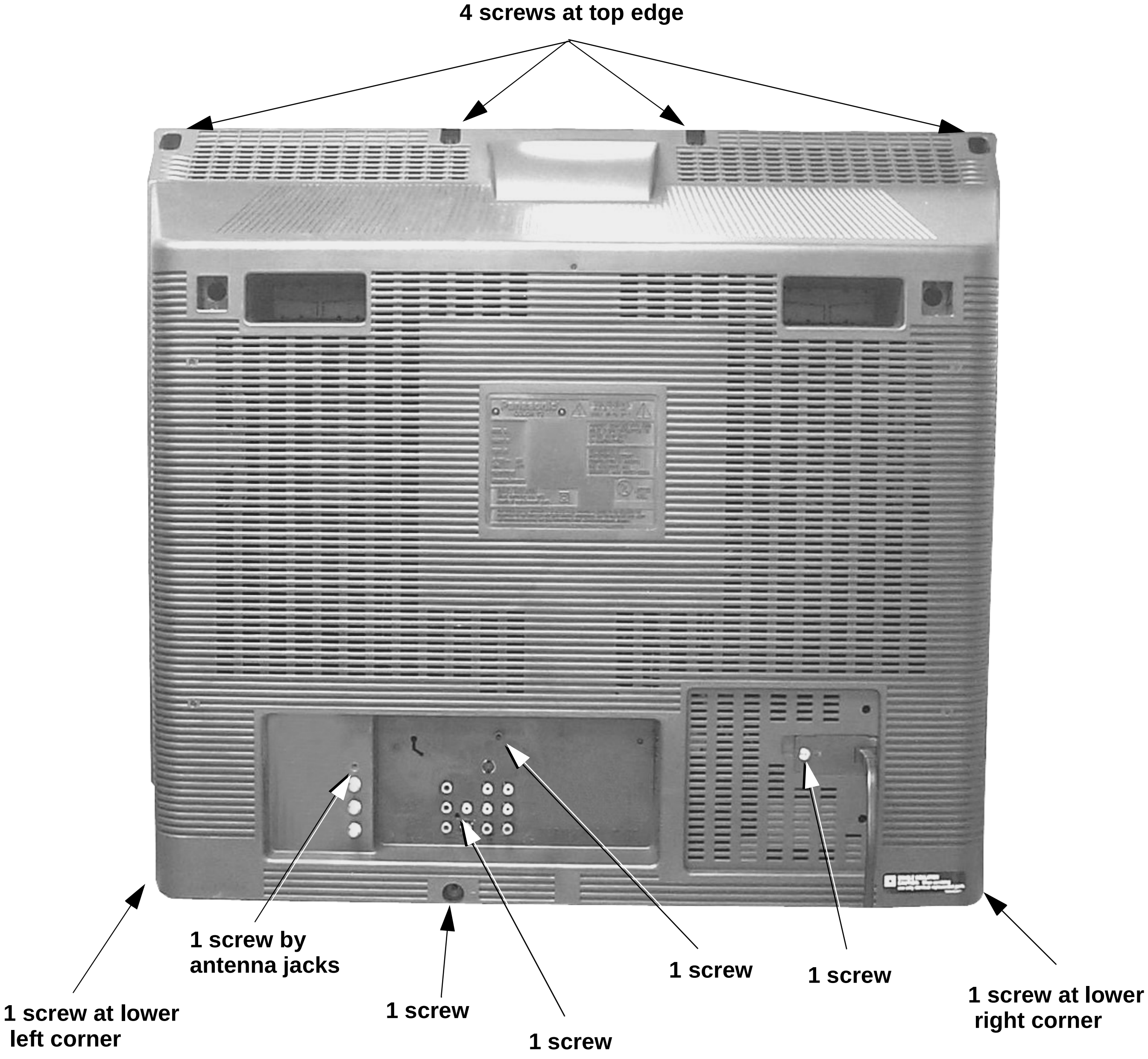
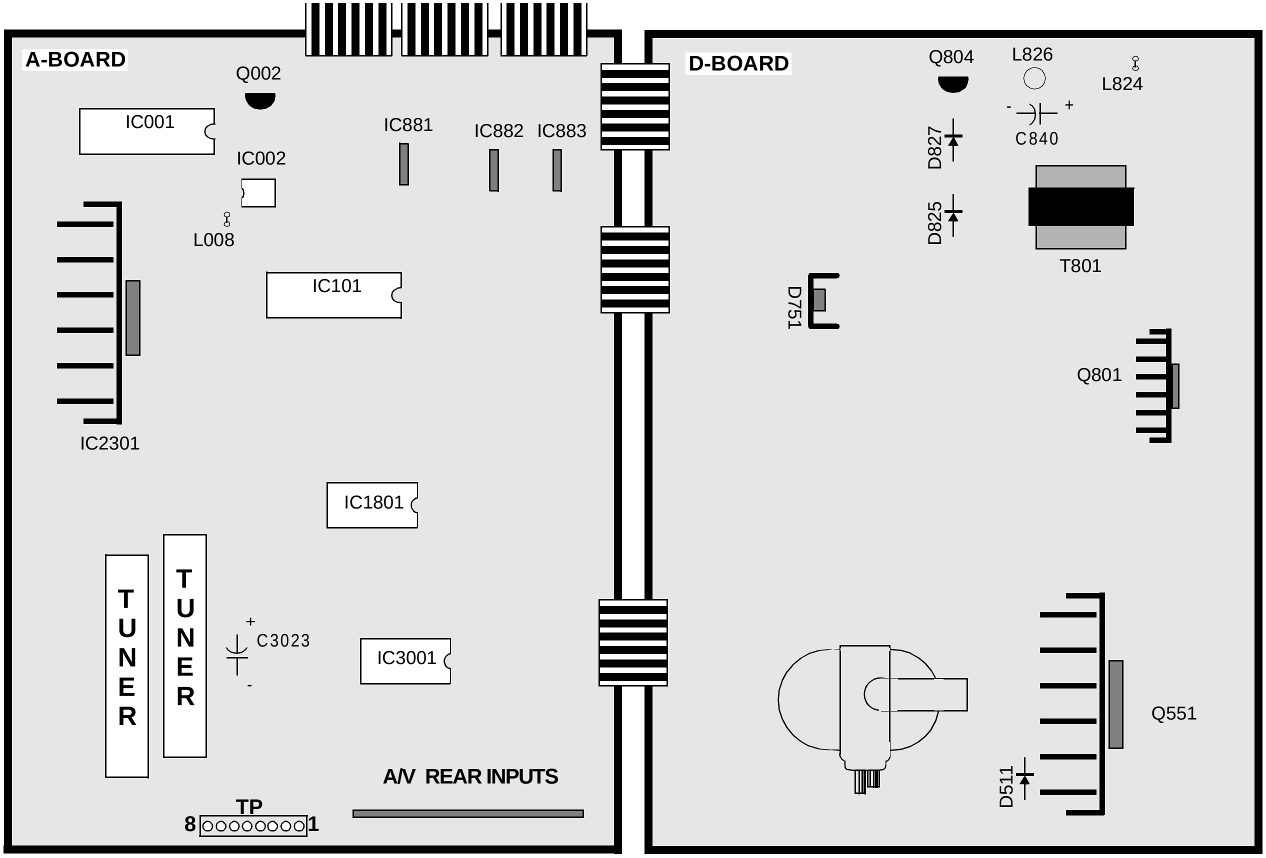

4 screws at top edge
1 screw by antenna jacks
1 screw
1 screw
1 screw at lower right corner
1 screw at lower left corner
1 screw
1 screw

Figure 8. **Back Cover Removal**

Chassis Service Adjustment Procedures

All service adjustments are factory preset and should not require adjustment unless controls and/or associated components are replaced.

Note: *Connect the (-) lead of the voltmeter to the appropriate ground. Use heat sink when the HOT ground symbol (⏚) is used. Otherwise, use COLD ground (⏚) — Tuner shield.*



A-BOARD
Q002
IC001
IC002
IC881
IC882
IC883
L008
IC101
IC2301
IC1801
TUNER
TUNER
+
C3023
-
IC3001
A/V REAR INPUTS
TP
8
1
D-BOARD
Q804
L826
L824
-
+
C840
D827
D825
T801
D751
Q801
Q551
D511

MOMENTARILY CONNECT A JUMPER FOR ENTERING SERVICE MODE (TP8 to COLD GND)

140.0V B+ Voltage Confirmation

1. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu.
2. Connect the DVM between **TPP17** (+ side) and cold ground (⏚).
3. Confirm that B+ voltage is **140.0V ± 1.5V**. This voltage supplies B+ to the Horizontal Output & Flyback circuits.

Source Voltage Chart

120V AC line input. Set the **Bright** and the **Picture** to Minimum by using the Picture Menu. Use cold ground (⏚) for the (-) lead of the DVM.

.

LOCATION (D-Board)		VOLTAGE
TPP17	*(by D825)* +B2	140.0V ± 1.5V
TPP25	*(by D827)* 9V	9.0V ± 1.5V
TPP19	*(by Q804)* 15V	15.0V ± 2.0V
TPP20	*(by C840)* 15V (VER.)	15.0V ± 1.5V
TPP21	*(by L826)* -15V (VER.)	-15.0V ± 1.5V
TPP22	(*by L824*) SOUND	32.5V ± 2.0V

LOCATION (D-Board)		VOLTAGE
TPD7	*(by D511)* 220V	220.0V ± 9.0V
LOCATION (A-Board)		**VOLTAGE**
TPA6	*(by IC883)* MAIN 12V	12.0V ± 0.5V
TPA7	*(by IC3001)* MAIN 9V	9.0V ± 0.5V
TPA8	*(by L008)* MAIN 5V	5.0V ± 0.3V
TPA16	*(by Q002)* STBY 3.3V	3.3V ± 0.2V
TPA18	*(by C3023)* BTL 30V	32.0V ± 2.0V

Adjust Picture Menu for normalized video adjustments.

High Voltage Check

1. Select an active TV channel and confirm that horizontal is in sync.
2. Adjust Brightness and Picture using Picture Icon menu so video just disappears.
3. Confirm B+ 140.0V is within limit.
4. Using a high voltage meter confirm that the High Voltage is **31.0kV ± 1.0kV**.

Purity and Convergence Procedure

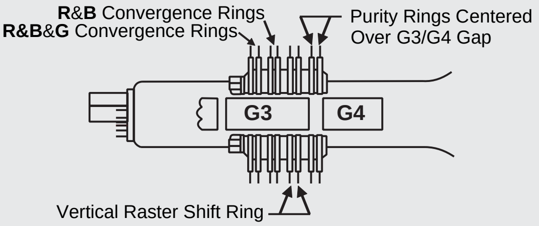
Adjustment is necessary only if the CRT or the deflection yoke is replaced or if the setting was disturbed. The complete procedure consists of:

1. Vertical Raster Shift Adjustment. **(Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings)**.
2. Initial static convergence.
3. Setting the purity.
4. Final static convergence.

When the CRT or the Yoke is Replaced

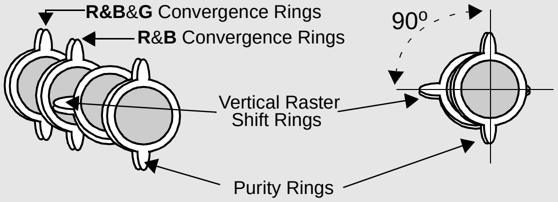
Place the yoke on the CRT neck (do not tighten the clamp).

Place the vertical raster shift tabs at 3 o'clock (90º from the purity and convergence tabs)



R&B Convergence Rings
R&B&G Convergence Rings
Purity Rings Centered Over G3/G4 Gap
G3
G4
Vertical Raster Shift Ring

Figure 9. **Positioning of Purity/Convergence Assembly (4 Pairs of Rings)**



R&B&G Convergence Rings
R&B Convergence Rings
90º
Vertical Raster Shift Rings
Purity Rings

Figure 10. **Positioning of Purity/Convergence Assembly (4 Pairs of Rings)**

Turn the Receiver ON. Operate the Receiver for 60 minutes using the first Purity Check field (white screen) to stabilize the CRT.

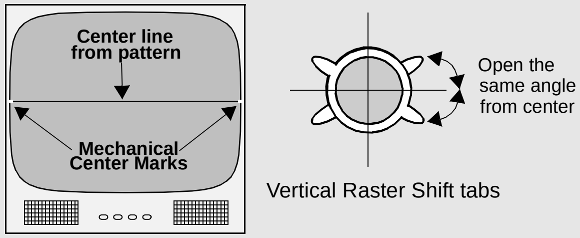
Fully degauss the Receiver by using an external degaussing coil.

Slide the deflection yoke back and forth on the neck of the CRT until it produces a near white, uniform raster.

Vertical Raster Shift Adjustment (Only for Models with Purity/Convergence Assembly with 4 Pairs of Rings).

Apply a green pattern with a horizontal line, adjust the Deflection Yoke so that has no tilt, then secure it.

Adjust center line of the pattern with the mechanical center of the CRT, this center is determined by two marks at the side edges of the screen. To adjust the line, once the vertical raster shift tabs are place at 3 o'clock to reduce its magnetic field effect (see Fig. 9 and Fig. 10) open the tabs the same angle from the center, until the center line of the pattern becomes a straight line, centered with the marks of the CRT. (see Fig. 11)



Center line from pattern
Mechanical Center Marks
Open the same angle from center
Vertical Raster Shift tabs

Figure 11. **Vertical Raster Shift Adjustment (4 pairs of rings assembly)**

Initial Center Static Convergence

Connect a dot/cross hatch generator to the Receiver and tune in a signal. Observe misconvergence at center of the screen only.

Adjust the R&B pole magnets; by separating tabs and rotating to converge blue with red.

Adjust the R&B and R&B&G pole magnets: by separating tabs and rotating to converge blue and red (magenta) with green.

Note: *Precise convergence at this point is not important.*

Purity Adjustment

When the Receiver is in the Serviceman Mode for making electronic adjustments, press the **Recall** button on the Remote Control to enter Purity Check. (See the **Service Adjustments Electronic Controls** procedure).

Operate the Receiver for 60 minutes using the first Purity Check field (white screen) to stabilize the CRT.

Fully degauss the Receiver by using an external degaussing coil.

Press the **Recall** button on the Remote Control again until the Purity Check (green screen) appears.

Loosen the deflection yoke clamp screw and move the deflection yoke back as close to the purity magnet as possible.

Adjust the Purity rings to set the vertical green raster precisely at the center of the screen (see Fig .12).

NOTES:
1. CRT warm up with white screen (three guns activated) is needed to stabilize the shadow mask expansion.
2. Initial center static convergence (roughly centers three gun beams) is required in order to perform purity adjustment.

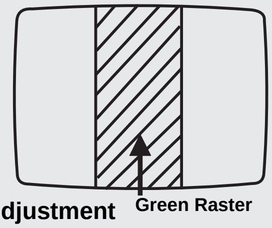


Figure 12. **Green Raster Adjustment**

Slowly move the deflection yoke forward until the best overall green screen is displayed.

Tighten the deflection yoke clamp screw.

Press the **Recall** button on the Remote Control again until the purity check blue and red screens appear and observe that good purity is obtained on each respective field.

Press the **Recall** button on the Remote Control again until Purity check (white screen) appears. Observe the screen for uniform white. If purity has not been achieved, repeat the above procedure.

Final Convergence Procedure (see Fig. 17 through Fig. 19):

Note: *Vertical size and focus adjustments must be completed prior to performing the convergence adjustment. Connect a dot pattern generator to the Receiver. The **Brightness** level should not be higher than necessary to obtain a clear pattern.*

Converge the red and the blue dots at the center of the screen by rotating the R&B pole Static Convergence Magnets.

Align The converged red/blue dots with the green dots at the center of the screen by rotating the R&B&G pole Static Convergence Magnets. Melt wax with soldering iron to reseal the magnets.

Slightly tilt vertically and horizontally (do not rotate) the deflection yoke to obtain a good overall convergence.

If convergence is not reached at the edges, insert permalloy (see following section) from the DY corners to achieve proper convergence. Recheck for purity and readjust if necessary.

After vertical adjustment of the yoke, insert wedge at 11 o'clock position, then make the horizontal tilt adjustment.

Secure the deflection yoke by inserting two side wedges at 3 and 7 o'clock positions.

Apply adhesive between tab (thin portion) of wedge and CRT and place tape over the tab to secure to the CRT.

Dynamic Corvergence Adjustment

Use this for a precisely overall convergence adjust at the edges.

DY(Y_{HC}, Y_{V}, X_{V}) Adjustment

Y_{V} Adjustment (VR1 for Horizontal dynamic convergence)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust VR1 (located in deflection yoke board Fig. 19) to obtain a proper corvergence at top and bottom of the screen (See Fi g.13)

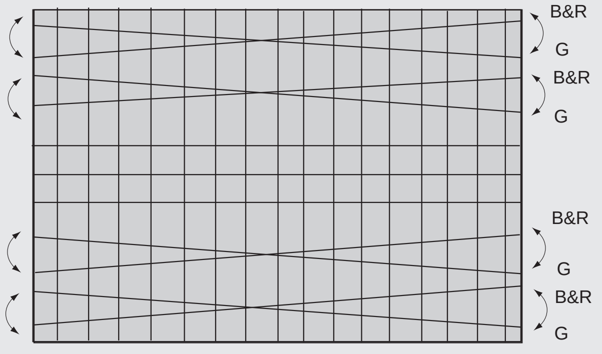


Figure 13. **VR1 Adjustment (Y_{V})**

Y_H Adjustment (VR2 for Vertical dynamic convergence)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver Adjust VR2 (located in deflection yoke board Fig. 19) to obtain a proper corvergence at left and right side of the screen. (See Fig. 14)

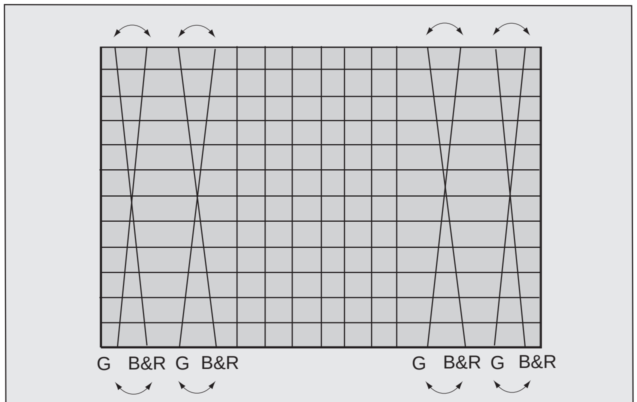


Figure 14. **VR2 Adjustment (Y_H)**

X_V Adjustment(precise adjustment)

1. Apply a crosshatch pattern.
2. Adjust contrast and brightness customer controls to obtain a correct picture.
3. With a driver adjust the coil located in deflection yoke board to obtain a proper convergence horizontally.

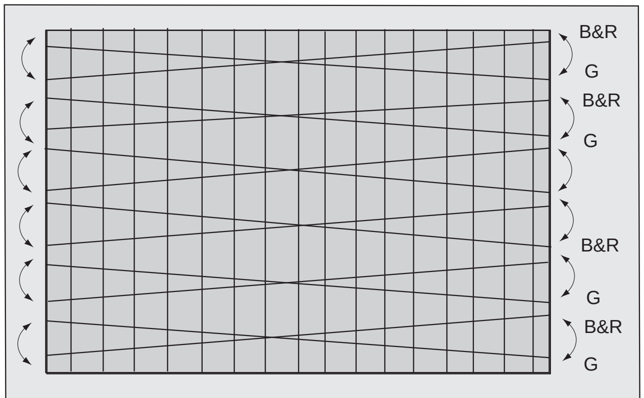


Figure 15. **X_V Adjustment**

Note: *Apply a red pattern and confirm purity, if purity is poor, repeat purity adjustments.*

Permalloy Convergence Corrector Strip (Part No. 0FMK014ZZ)

This strip is used in some sets to match the yoke and CRT for optimum convergence. If the yoke or CRT is replaced, the strip may not be required.
First converge the set without the strip and observe the corners.

If correction is needed:

1. Place strip between CRT and yoke, in quadrant needing correction. Slowly move it around for desired results.
2. Press adhesive tightly to the CRT and secure with tape.

DAF Adjustment

Preparation:

1. Apply a crosshatch pattern.
2. Set user controls, bright to center and picture to max.
3. Connect a frequency counter to TPD10.

Procedure:

1. Connect channel one of the oscilloscope with 10x1 probe to TPP33.
2. Connect channel two of the oscilloscope with 10x1 probe to CRT HEATER (L-Board).
3. Adjust R1581 so that frequency counter reads 15.7kHz±100Hz.

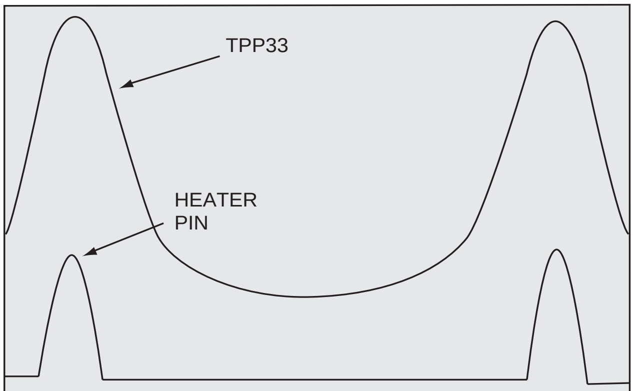
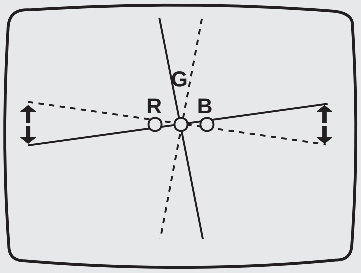


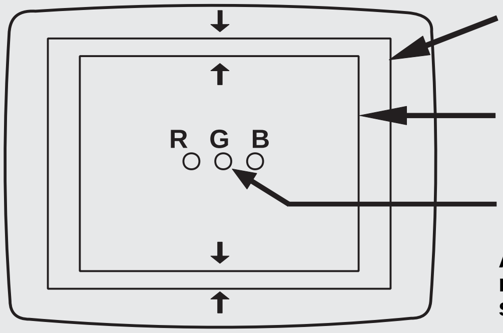
Figure 16. **DAF Adjustment**

4. Adjust R1577 so that signal on TPP33 is on phase with CRT HEATER (L-Board) pin. (see Fig. 16)



As the yoke is tilted vertically, the rasters produced by the outside guns rotate in opposite directions.

Figure 17. **Vertical Yoke Movement**



Raster produced from one of the outside electron beams

Raster from the other side electron beam

Static convergence magnets are set for center convergence

As the yoke is tilted horizontally, one raster gets larger while the other gets smaller

Figure 18. **Horizontal Yoke Movement**

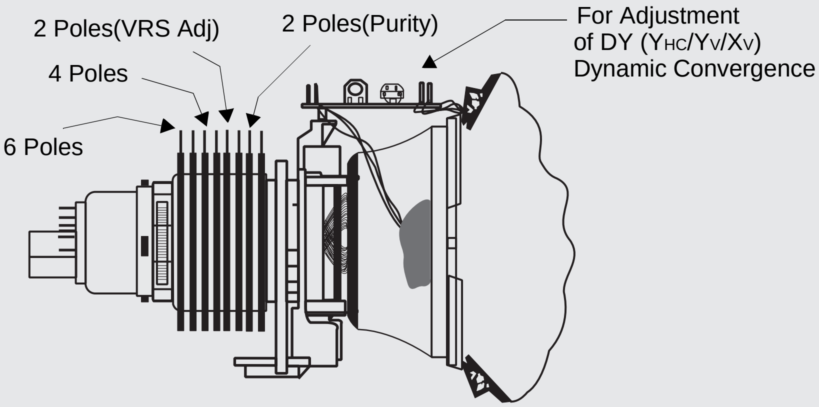

2 Poles(VRS Adj)
2 Poles(Purity)
For Adjustment
of DY (Y_{HC}/Y_V/X_V)
Dynamic Convergence
4 Poles
6 Poles

Figure 19. **Convergence Magnets and Wedges Location**

IMPORTANT NOTE:
Always Exit the Serviceman
Mode Following Adjustments.

Serviceman Mode (Electronic Controls)

This Receiver has electronic technology using the I^{2}C Bus Concept. It performs as a control function and it replaces many mechanical controls. Instead of adjusting mechanical controls individually, many of the control functions are now performed by using “On Screen Display Menu”. (The **Serviceman Adjustment Mode**.)

Note: *It is suggested that the technician reads all the way through and understand the following procedure for Entering/Exiting the **Serviceman Adjustment Mode**; then proceed with the instructions working with the Receiver. When becoming familiar with the procedure, the Flow Chart for Serviceman Mode may be used as a quick guide.*

Quick Entry to Serviceman Mode:

At times when minor adjustments need to be done to the electronic controls, the method of Entering the serviceman Mode without removal of the cabinet back is as follows using the Remote Control:

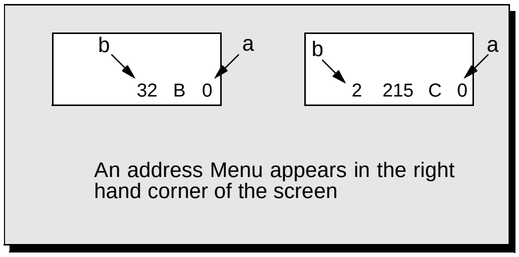
1. Select SET-UP icon and select CABLE mode.
2. Select TIMER icon and set SLEEP time for 30 Min.
3. Press ACTION button 3 times to exit menus.
4. Tune to the Channel 124.
5. Adjust VOLUME to minimum (0).
6. Press the VOL ◀ button (decrease) **on Receiver**. Red “CHK” appears in upper corner.

To toggle between Aging and Serviceman modes:

While the “CHK” is displayed on the left top corner of the CRT, pressing the Action and the Volume Up buttons on the Receiver simultaneously will toggle between the modes. Red “CHK” for Serviceman and yellow “CHK” for Aging.

7. **Press** the **Power** Button on the **Remote Control** to select one of the Serviceman Adjustment Modes.
    1) **B**= Serviceman VCJ SUB-DATA ADJUSTEMENT.
    2) **C**= Serviceman VCJ CUT-OFF ADJUSTMENT.
    3) **D**= Serviceman GEOMETRY ADJUSTMENT.
    4) **M**= Serviceman MTS ADJUSTMENTS.
    5) **P**= Serviceman PIP ADJUSTMENT.
    6) **S**= Serviceman S OPTION ADJUSTMENTS.
    7) **X** = Serviceman X OPTION ADJUSTMENT.
    8) **E** = Serviceman E OPTION ADJUSTMENTS
    9) “**CHK**” = Normal operation of CHANNEL ▲▼ and VOLUME ◀ ▶.

Note: *Only the applicable settings for the Receiver serviced will be available (See **a** in Fig. 20).*



An address Menu appears in the right hand corner of the screen

Figure 20. **Serviceman Mode Menu Adjustments.**

Exiting the Serviceman Mode:

Press the **Action** and the **Power** buttons on the **Receiver** simultaneously for at least 2 seconds.

THE RECEIVER EXITS SERVICEMAN MODE.

The Receiver momentarily shuts off; then comes back on tuned to channel 3 with a preset level of sound. Any programmed channels, channels caption data and some others user defined settings will be erased.

IMPORTANT NOTE:
Always Exit the Serviceman Mode
Following Adjustments.

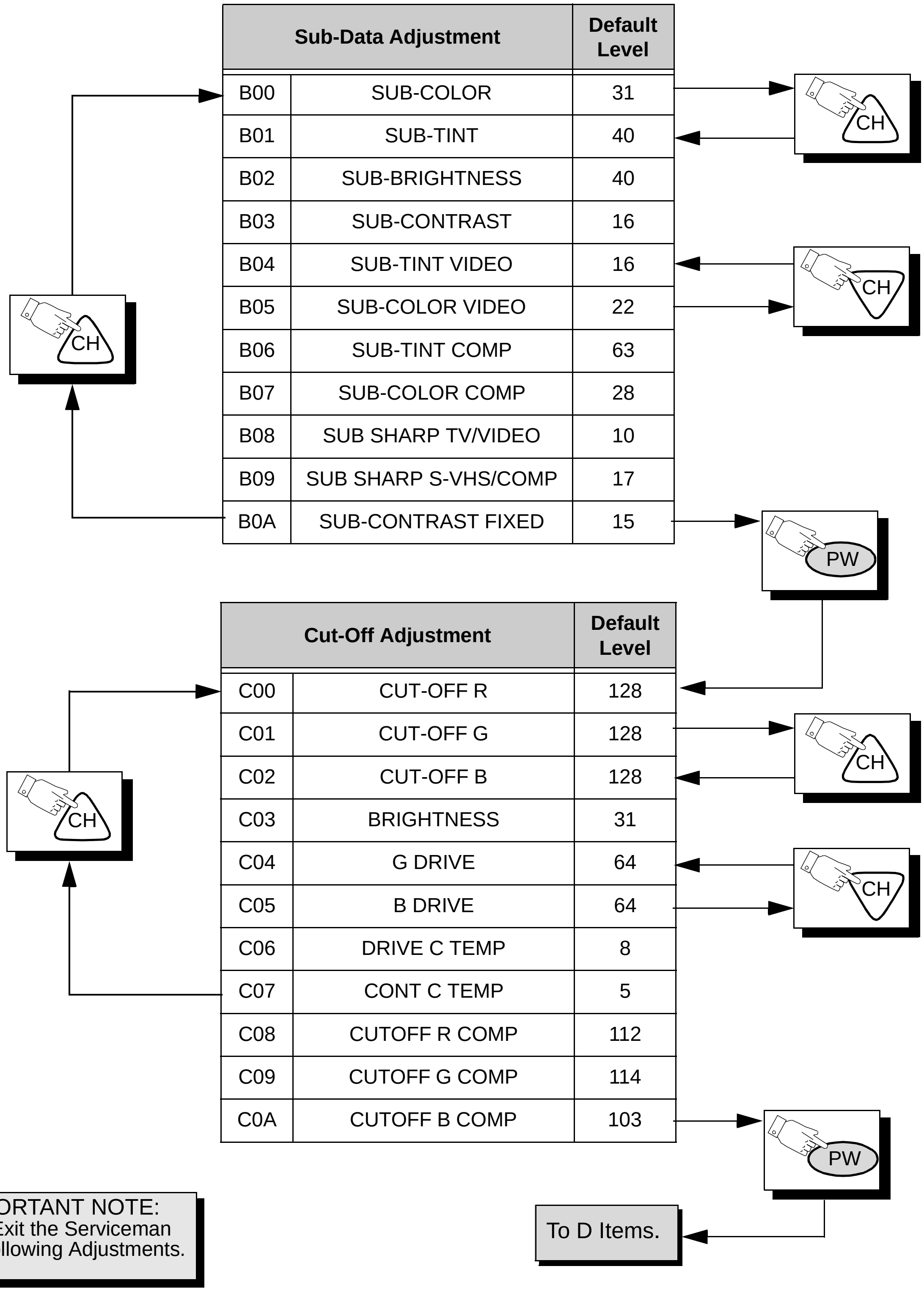
Press the **Power Button** on the **Remote Control** to select the Serviceman Adjustment .

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 20).

Note: *Write Down the original value set (**b** in* Fig. 20*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 20).



Sub-Data Adjustment		Default Level
B00	SUB-COLOR	31
B01	SUB-TINT	40
B02	SUB-BRIGHTNESS	40
B03	SUB-CONTRAST	16
B04	SUB-TINT VIDEO	16
B05	SUB-COLOR VIDEO	22
B06	SUB-TINT COMP	63
B07	SUB-COLOR COMP	28
B08	SUB SHARP TV/VIDEO	10
B09	SUB SHARP S-VHS/COMP	17
B0A	SUB-CONTRAST FIXED	15

Cut-Off Adjustment		Default Level
C00	CUT-OFF R	128
C01	CUT-OFF G	128
C02	CUT-OFF B	128
C03	BRIGHTNESS	31
C04	G DRIVE	64
C05	B DRIVE	64
C06	DRIVE C TEMP	8
C07	CONT C TEMP	5
C08	CUTOFF R COMP	112
C09	CUTOFF G COMP	114
C0A	CUTOFF B COMP	103

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

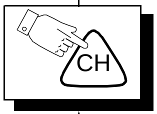
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

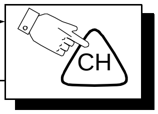
1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 20).

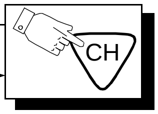
Note: *Write Down the original value set (**b** in* Fig. 20*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

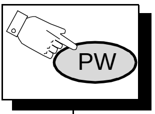
2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 20).

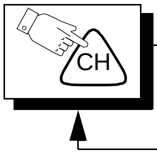


Geometry Adjustments		Default Level
D00	H POSITION	13
D01	V SIZE	37
D02	V S CORRECTION	5
D03	V LIN CORRECTION	8
D04	E/W TRAPEZIUM	9
D05	V AGC	1
D06	V POSITION	1
D07	V CENTERING	65
D08	V CENTERING DAC SW	0
D09	V-BLK START	12
D0A	V-BLK STOP	14
D0B	EW CORNER	6
D0C	EW PARABOLA	11
D0D	H WIDTH	20
D0E	OSD POSITION	90

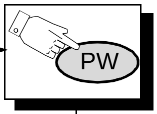








MTS Adjustment		Default Level
M00	INPUT LEVEL	33
M01	LOW-LEVEL SEPARATION	6
M02	HIGH-LEVEL SEPARATION	25



To P Items.

Note: *Some adjustment modes may not be available in some formats.*

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

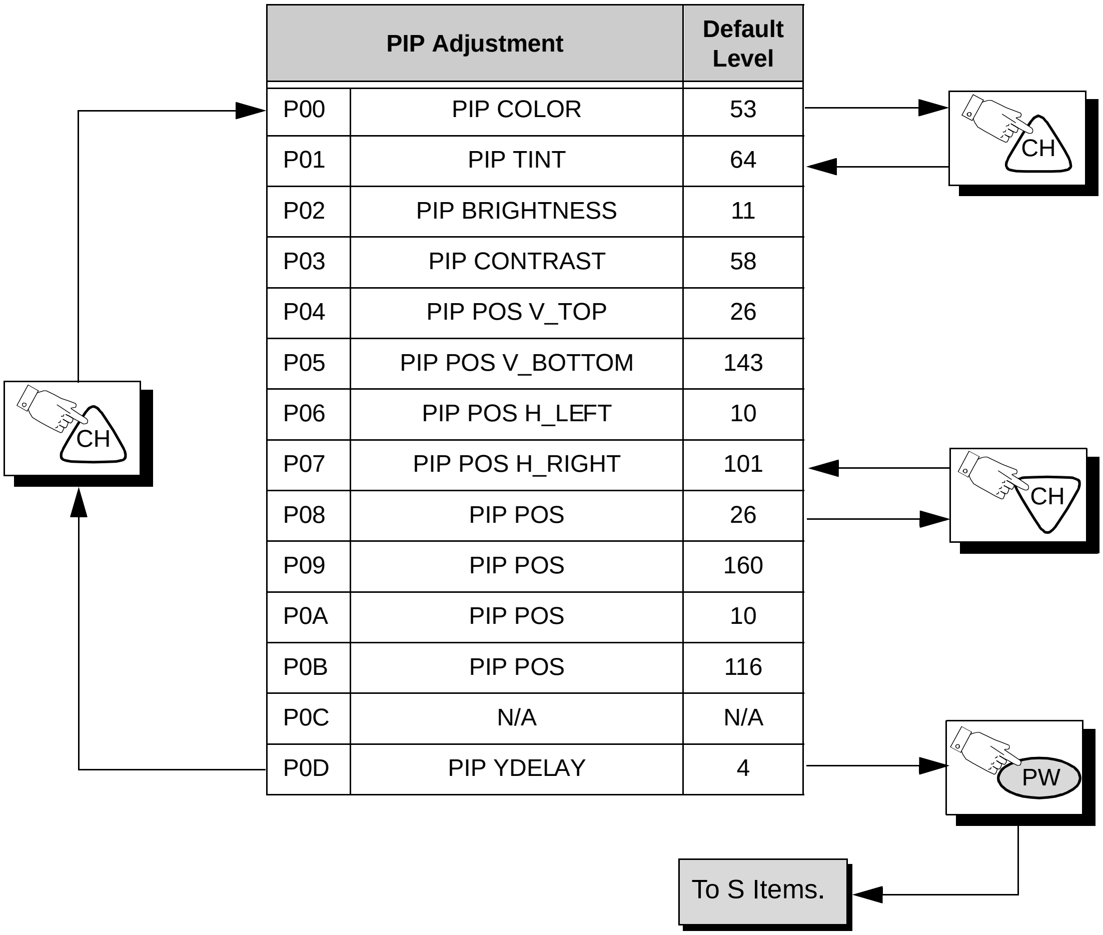
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 20).

Note: *Write Down the original value set (**b** in* Fig. 20*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 20).



PIP Adjustment		Default Level
P00	PIP COLOR	53
P01	PIP TINT	64
P02	PIP BRIGHTNESS	11
P03	PIP CONTRAST	58
P04	PIP POS V_TOP	26
P05	PIP POS V_BOTTOM	143
P06	PIP POS H_LEFT	10
P07	PIP POS H_RIGHT	101
P08	PIP POS	26
P09	PIP POS	160
P0A	PIP POS	10
P0B	PIP POS	116
P0C	N/A	N/A
P0D	PIP YDELAY	4

Note: *Some adjustment modes may not be available in some formats.*

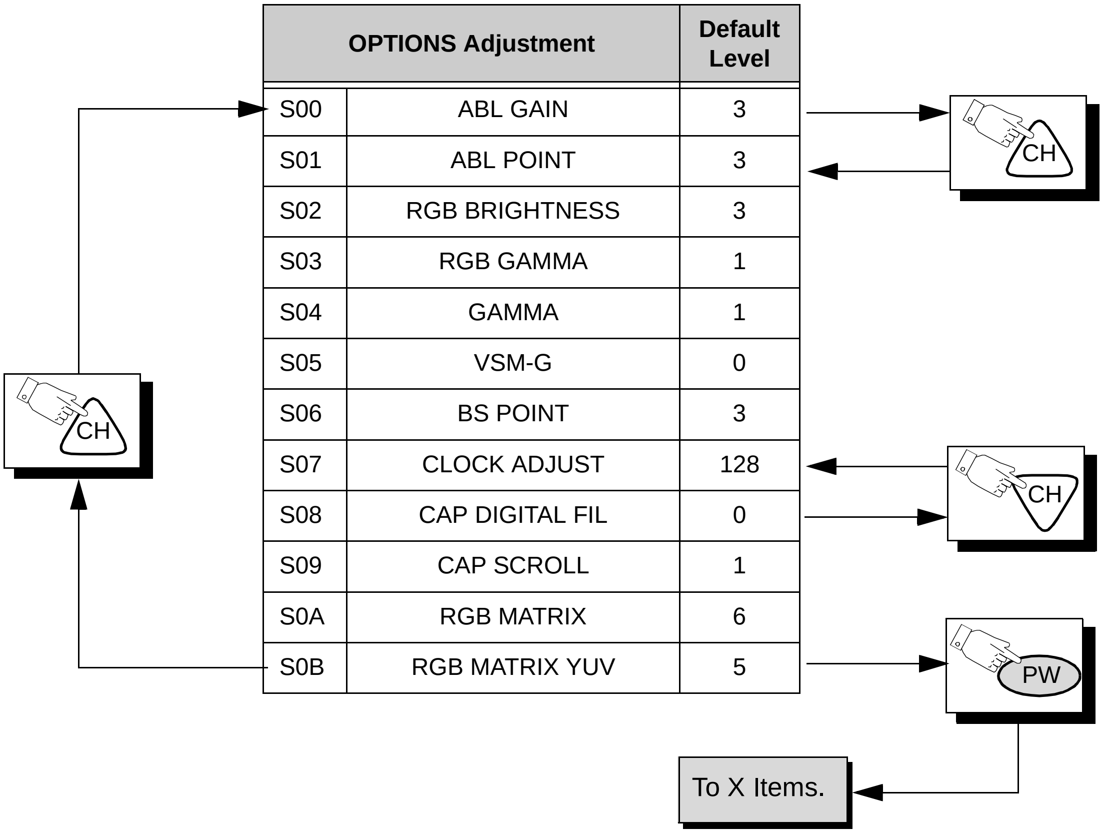
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 20).

Note: *Write Down the original value set (**b** in* Fig. 20*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 20).



OPTIONS Adjustment		Default Level
S00	ABL GAIN	3
S01	ABL POINT	3
S02	RGB BRIGHTNESS	3
S03	RGB GAMMA	1
S04	GAMMA	1
S05	VSM-G	0
S06	BS POINT	3
S07	CLOCK ADJUST	128
S08	CAP DIGITAL FIL	0
S09	CAP SCROLL	1
S0A	RGB MATRIX	6
S0B	RGB MATRIX YUV	5

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

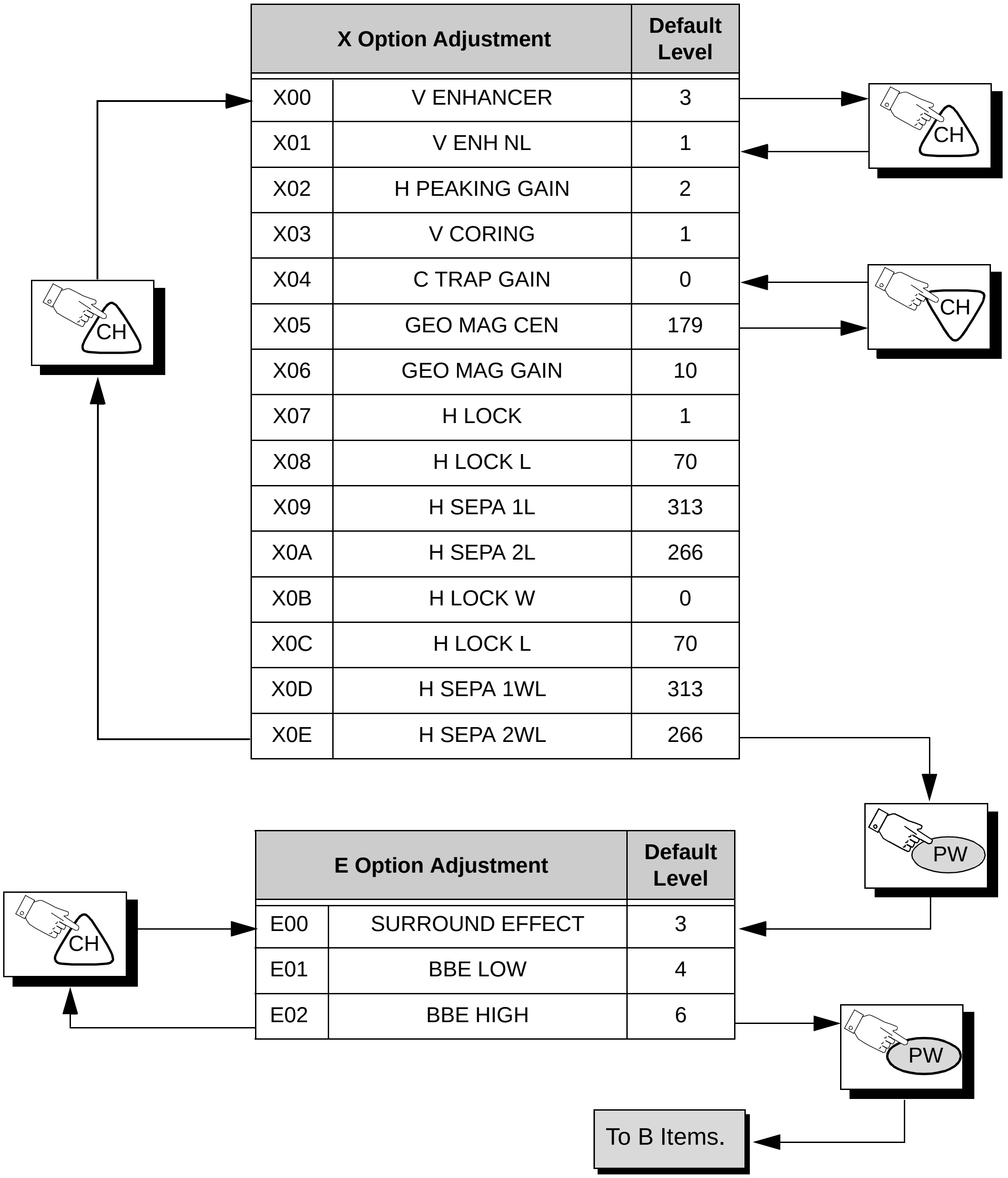
Press the Power Button on the Remote Control to select the Serviceman Adjustment

For Adjustments:

1. **Press Channel Up/Down** on the **Remote Control** to select one of the available Service Adjustments (**a** in Fig. 20).

Note: *Write Down the original value set (**b** in* Fig. 20*) for each address before modifying anything. It is easy to erroneously adjust the wrong item.*

2. **Press Volume Up/Down** on the **Remote Control** to adjust the level of the selected Service Adjustment (**b** in Fig. 20).



X Option Adjustment		Default Level
X00	V ENHANCER	3
X01	V ENH NL	1
X02	H PEAKING GAIN	2
X03	V CORING	1
X04	C TRAP GAIN	0
X05	GEO MAG CEN	179
X06	GEO MAG GAIN	10
X07	H LOCK	1
X08	H LOCK L	70
X09	H SEPA 1L	313
X0A	H SEPA 2L	266
X0B	H LOCK W	0
X0C	H LOCK L	70
X0D	H SEPA 1WL	313
X0E	H SEPA 2WL	266

E Option Adjustment		Default Level
E00	SURROUND EFFECT	3
E01	BBE LOW	4
E02	BBE HIGH	6

To B Items.

To Check Purity:

Press the **Recall** Button on the **Remote Control** when in Serviceman Mode (red “CHK” is displayed) to enter the Purity Field Check Mode.

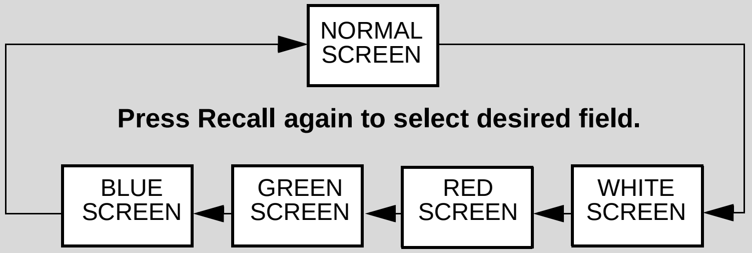

NORMAL SCREEN
Press Recall again to select desired field.
BLUE SCREEN
GREEN SCREEN
RED SCREEN
WHITE SCREEN

Figure 21. **Purity Check Field Mode**.

Helpful Hints

Entering Serviceman Mode (Back-Open Method)

1. While the Receiver is ON or Puggled and operating in Normal Mode, momentarily short test point **FA1** (TP8) to Cold Ground (⏚) **FA2** (TP3) A-Board.
   The Receiver enters the Aging Mode.
   Yellow letters “CHK” appear in the upper left corner of the CRT.
   (The Volume Up/Down will adjust rapidly).
2. Simultaneously press the **Action** and the **Volume Up** buttons on the **Receiver** Control Panel.
   The Receiver enters the Serviceman Mode.
   The letter in “CHK” turn red.
   (The Volume Up/Down will adjust normally).
   (All customer controls are set to nominal level).

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Instructional Flow Chart for Serviceman Mode

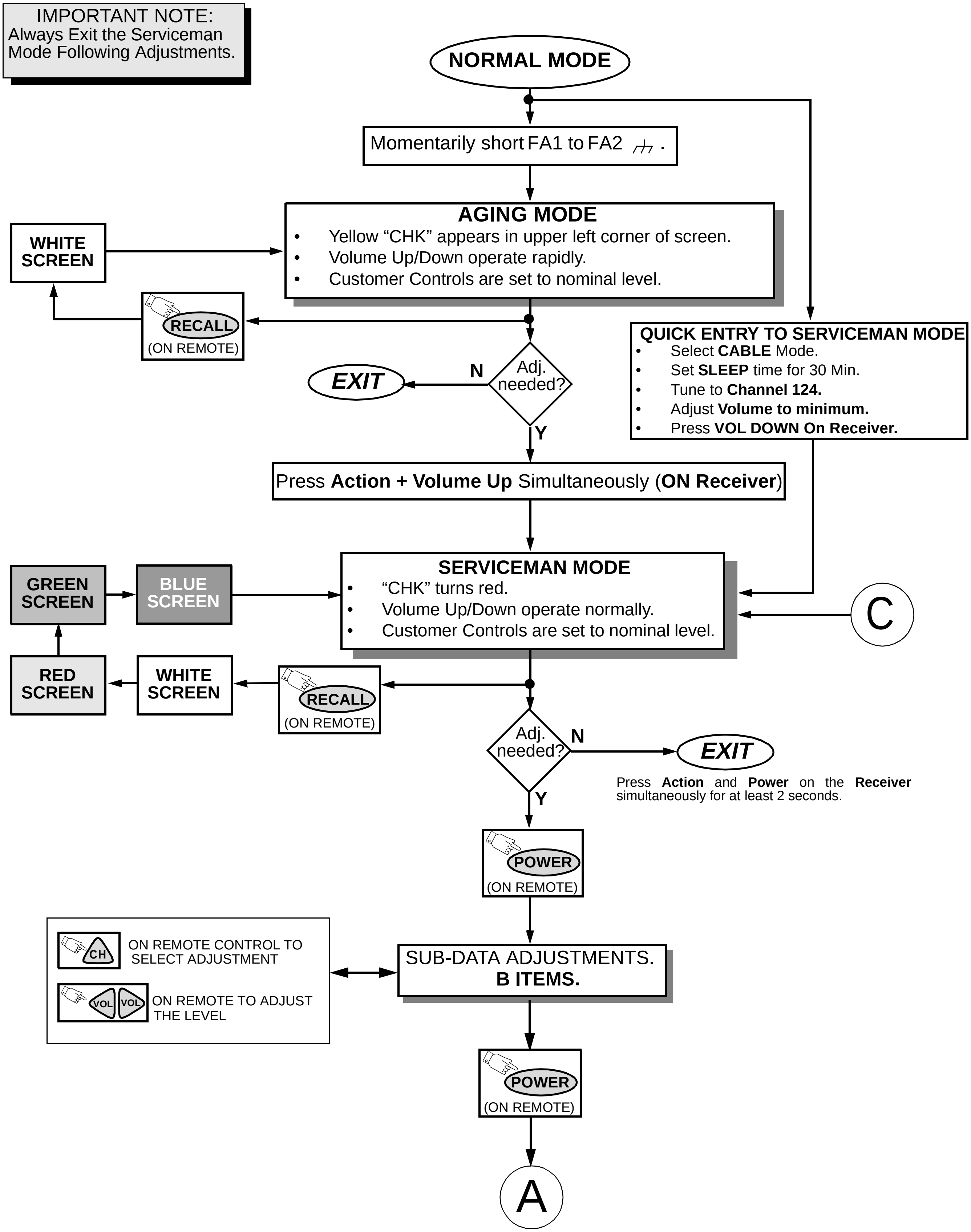
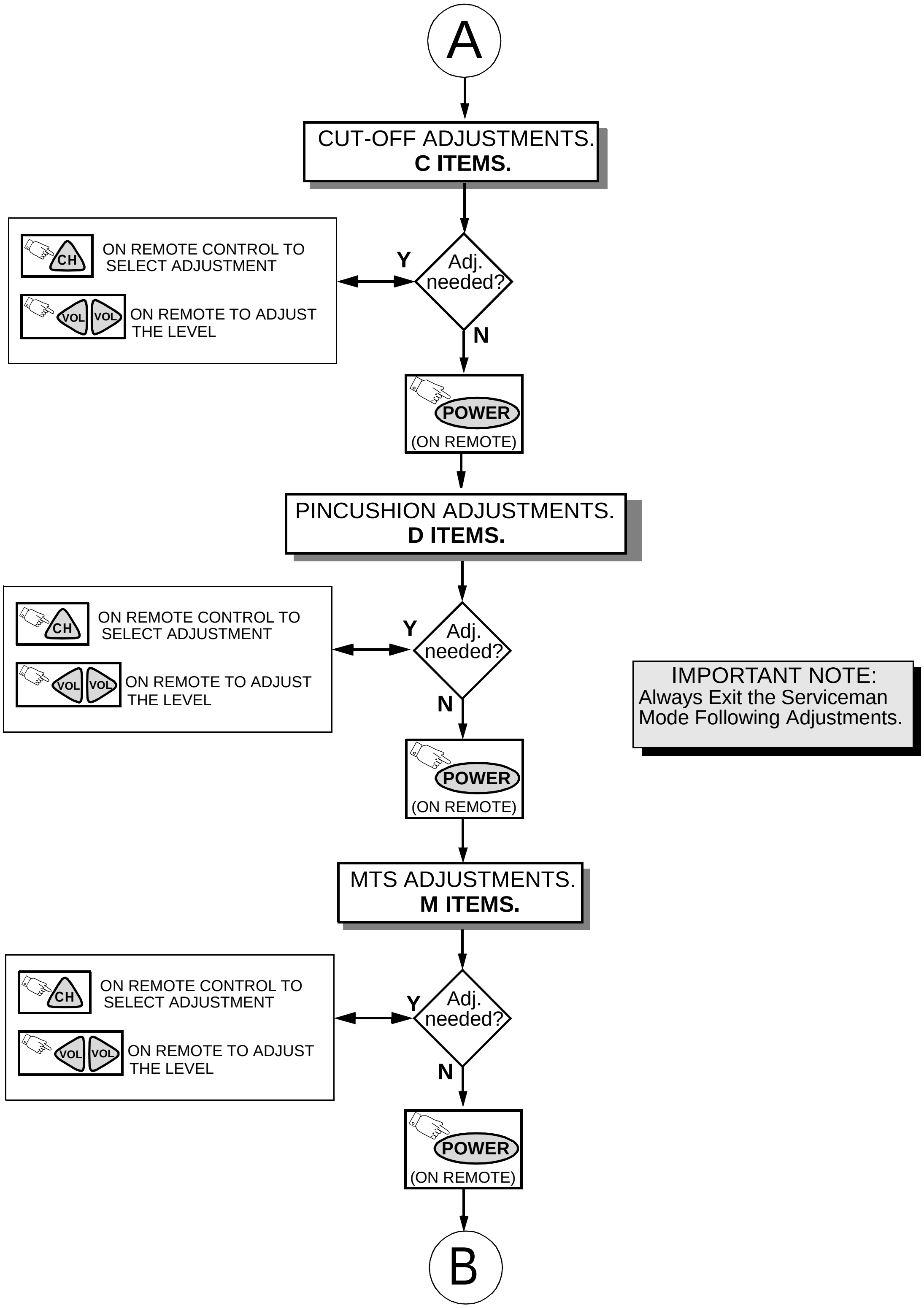

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.
NORMAL MODE
Momentarily short FA1 to FA2 .
AGING MODE
• Yellow "CHK" appears in upper left corner of screen.
• Volume Up/Down operate rapidly.
• Customer Controls are set to nominal level.
WHITE SCREEN
RECALL
(ON REMOTE)
EXIT
N
Adj. needed?
Y
QUICK ENTRY TO SERVICEMAN MODE
• Select CABLE Mode.
• Set SLEEP time for 30 Min.
• Tune to Channel 124.
• Adjust Volume to minimum.
• Press VOL DOWN On Receiver.
Press Action + Volume Up Simultaneously (ON Receiver)
GREEN SCREEN
BLUE SCREEN
SERVICEMAN MODE
• "CHK" turns red.
• Volume Up/Down operate normally.
• Customer Controls are set to nominal level.
C
RED SCREEN
WHITE SCREEN
RECALL
(ON REMOTE)
Adj. needed?
N
EXIT
Press Action and Power on the Receiver simultaneously for at least 2 seconds.
Y
POWER
(ON REMOTE)
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL
VOL
ON REMOTE TO ADJUST THE LEVEL
SUB-DATA ADJUSTMENTS.
B ITEMS.
POWER
(ON REMOTE)
A

Figure 22. **Flow Chart for Serviceman Mode.**

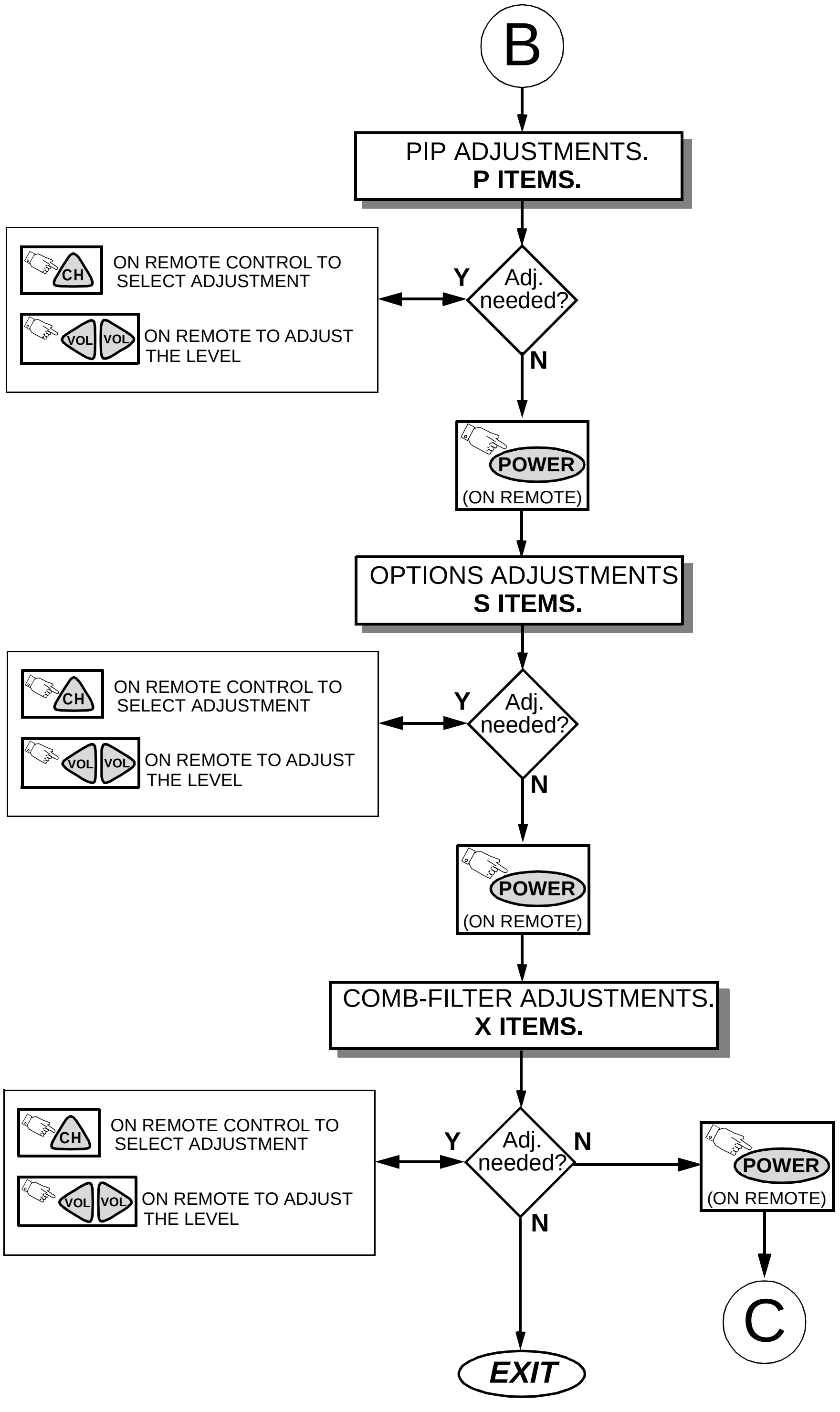
Instructional Flow Chart for Serviceman Mode - Continued


A
CUT-OFF ADJUSTMENTS.
C ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL
VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
POWER
(ON REMOTE)
PINCUSHION ADJUSTMENTS.
D ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL
VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
POWER
(ON REMOTE)
MTS ADJUSTMENTS.
M ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL
VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
POWER
(ON REMOTE)
B

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Figure 23. **Flow Chart for Serviceman Mode (cont).**

Instructional Flow Chart for Serviceman Mode - Continued


B
PIP ADJUSTMENTS.
P ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
POWER
(ON REMOTE)
OPTIONS ADJUSTMENTS
S ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
POWER
(ON REMOTE)
COMB-FILTER ADJUSTMENTS.
X ITEMS.
CH
ON REMOTE CONTROL TO SELECT ADJUSTMENT
VOL VOL
ON REMOTE TO ADJUST THE LEVEL
Y
Adj. needed?
N
N
POWER
(ON REMOTE)
C
EXIT

Press **Action** and **Power** on the **Receiver** simultaneously for at least 2 seconds.

Figure 24. **Flow Chart for Serviceman Mode (cont).**

Note: *Some adjustments modes may not be available in some models depending on available options.*

IMPORTANT NOTE:
Always Exit the Serviceman Mode Following Adjustments.

Service Adjustments (Electronic Controls)

Sub-Contrast Adjustment

Serviceman DAC Adjustment (B02, B03)
This adjustment is factory set. **Do not adjust** unless repairs are made to associated circuit, the CRT Board or when the CRT is replaced.

Preparation:
1. Apply a Black-White pattern.
2. Set the picture settings to normal and color to minimum.
3. RGB GAMMA (S03) DAC from 1 to 0
4. Connect the oscilloscope to TP47R.
5. Connect a jumper from TPD2 to cold ground (⏚).

Procedure:
1. In the Serviceman Mode, select DAC B2 for Sub-Brightness to obtain 2.6±0.1V between 7.5IRE and GND level at TP47R (See Fig. 25)
2. In the Serviceman Mode, select DAC B03 for Sub-Contrast to obtain 1.5±0.1V between 7.5IRE and 100IRE level at TP47G
3. Remove short jumper and set RGB GAMMA (S03) DAC to 1.
4. Set the picture settings to normal.

.

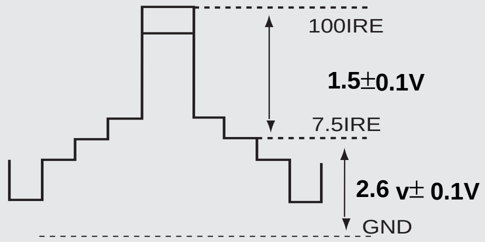


Figure 25. **waveform**

Sub-Brightness (B02)

Adjustment of this control is important for setting proper operation of customer brightness and picture controls. **Do not adjust** the SCREEN VR after the Sub-Brightness is set.

Preparation:
1. Normalize picture settings.
2. Switch COLOR TEMPERATURE to NORMAL.

Procedure:
1. Apply a black white cross pattern.
2. In the Serviceman Mode for making electronic adjustments, select the DAC adjustment (B02) and adjust data so that 7.5IRE part is the same light output as the 3IRE part (See Fig. 26).

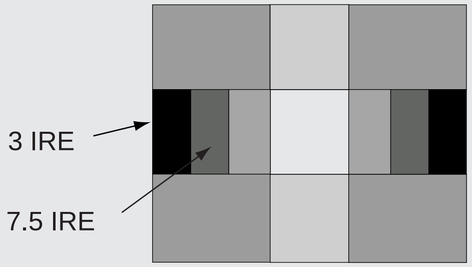


Figure 26. **Pattern**

Tint/Color Adjustment

Serviceman DAC Adjustment (B01) (B00)

Preparation:
1. Apply a rainbow color bar signal.
2. Preset the following controls:
   - Brightness .... Min.
   - Color .... Center.
   - Tint .... Center.
   - Picture .... Max.
   - Sharpness .... Min.
3. Set RGB GAMMA (S03) DAC to 0
4. Connect the oscilloscope to TP47B (A-Board).
5. Connect a jumper from TPD2 to GND (⏚).

Procedure:
1. In the Serviceman Mode for making electronic adjustments, select (B01) DAC Sub-Tint Adjustment. Adjust until the waveform measured is as the one shown in Fig. 27.

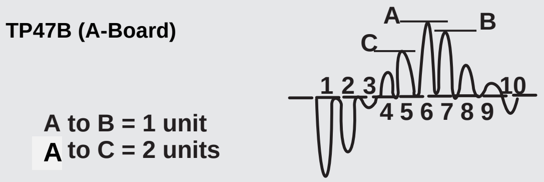


Figure 27. **TP47B waveform**

2. Connect the oscilloscope to TP47G or TP35 (L-Board) and cold GND.
3. Select DAC Sub-Color Adjustment (B00) and adjust for peak to peak amplitude to be **0.50Vp-p ±0.05V** as shown in Fig .28.

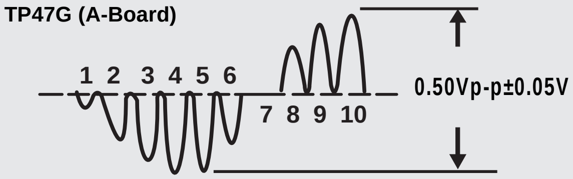


Figure 28. **TP47G waveform**

4. Remove short jumper and set RGB GAMMA (S03) DAC to 1.

PIP Sub-Contrast Adjustment (P03)

Procedure:

1. Connect the oscilloscope to TPY1.
2. Apply a color bar signal in main and PIP (PIP on).
3. In the Serviceman Mode for making electronic adjustments, select the DAC adjustment (P03) for PIP Sub-Subcontrast so that child (PIP) level is 90% of parent (MAIN) signal (See Fig. 29)

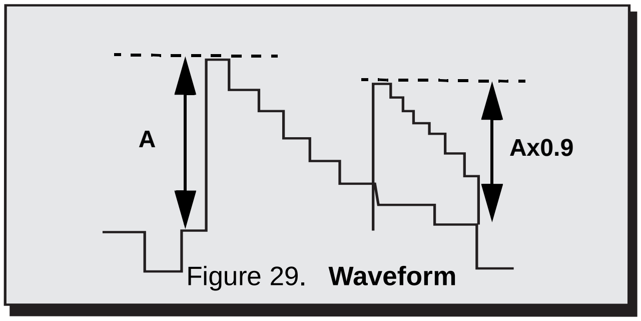


Figure 29. **Waveform**

Color Temperature Adjustment (B/W Tracking)

Serviceman DAC Adjust.
(C00) (C01) (C02) (C04) (C05)
Minor Touch-Up Method

OBSERVE low and high brightness areas of a B/W picture for proper tracking. Adjust only as required for "good gray scale and warm highlights".

1. LOW LIGHT areas – In Serviceman Mode for making electronic adjustments, select Cutoff (C00) RED, (C01) GRN, (C02) BLU and adjust the picture for gray.
2. HIGH LIGHT areas – In Serviceman Mode for making electronic adjustments, select Drive (C04) GRN, (C05) BLU and adjust the picture for warm whites.

Complete Adjustment

Preparation:

1. Turn the Receiver "ON" and allow 10 minutes warm up at high brightness.
2. Apply a color bar signal with color "OFF".
3. Turn the SCREEN control (part of FBT T551) fully counterclockwise.

Procedure:

Preset the following Serviceman DACs for best results:

- C0. 128
- C1. 128
- C2. 128
- C4. 64
- C5. 64

1. Connect the oscilloscope to TP37 (L-Board).
2. In Serviceman Mode for making electronic adjustment, select the Sub-Bright DAC (B02).
3. Press the R-Tune key on the remote.
4. Observe the oscilloscope waveform at Horizontal rate and adjust the Serviceman Mode Sub-Bright DAC (B02) level until a scanning period of **2.3±0.05V** above DC ground is measured, as indicated in Fig. 30.

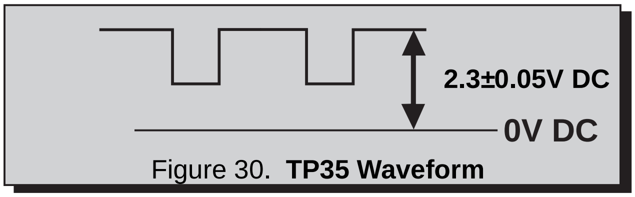


Figure 30. **TP35 Waveform**

5. Press the R-Tune key on the remote.
6. Connect the scope to RED Cathode (KR) on the CRT-Board.
7. In the Serviceman Mode for making electronic adjustments, select the RED CUTOFF DAC (C00).
8. Press the R-Tune key on the remote.
9. View scope trace at Horizontal rate and adjust the Serviceman Mode DAC (C00) level until a scanning period of **170±2V** above DC ground is measured, as indicated in Fig. 31.
10. Press the R-Tune key on the remote.
11. Write the same C00 data to C01 and C02.
12. Press the R-Tune key on the remote.
13. Turn the Screen Control (part of FBT) slowly clockwise until a slightly color horizontal line appears.
14. Adjust DAC C01 and C02 until the horizontal line becomes white.
15. Press the R-Tune key on the Remote

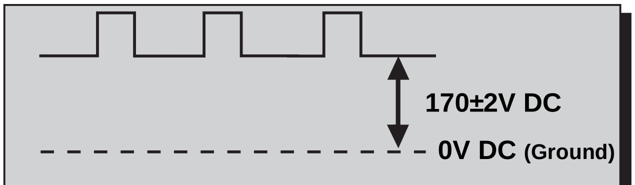


Figure 31. **KR Waveform**

16. In the Serviceman Mode for making electronic adjustments select the DAC DRIVE adjustments (C04) GRN, (C05) BLUE and adjust for warm white in a white color bar pattern.
17. Apply a monoscope pattern and check for a good picture.
18. EXIT the Serviceman Mode.

Service Adjustments (Electronic Controls, cont.)

Horizontal Centering (D00)

This Adjustment helps to center the picture horizontally

Preparation:

Connect a monoscope pattern signal.

Procedure:

1. In the Serviceman Mode for making electronic adjustments. Select the Horizontal Centering Adjustment DAC (D00) and adjust until the center of the monoscope pattern is centered on CRT.
2. EXIT the Serviceman Adjustment Mode.

E-W PCC Adjustment (D0C)

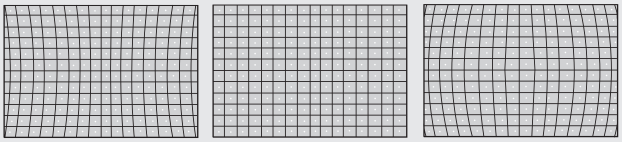
This adjustmet helps to correct left and right sides of picture.

Preparation:

1. Apply a Crosshatch pattern
2. Normalize the Picture Icon Video adjustments.

Procedure:

1. Adjust “D0C” DATA so that the 1st line and 3rd line make a good balance (See Fig. 32).



Min. Adjustment Correct Adjustment Max. Adjustment

Figure 32. **E-W PCC Adjustment**

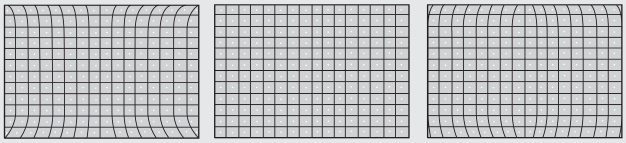
Corner PCC Adjustment (D0B)

Preparation:

1. Apply a Crosshatch pattern
2. Normalize the Picture Icon Video adjustments.

Procedure:

1. To adjust upper and lower linearity.
2. Adjust “D0B” to straighten upper and lower lines (See Fig. 33)



Min. Adjustment Correct Adjustment Max. Adjustment

Figure 33. **Corner Adjustment**

H-Size Adjustment (D0D)

Preparation:

1. Apply a Monoscope pattern

Procedure:

1. Adjust “D0D” DATA so that width “A” and “B” becomes 5.00±0.40 (when using factory pattern) (See Fig. 34).

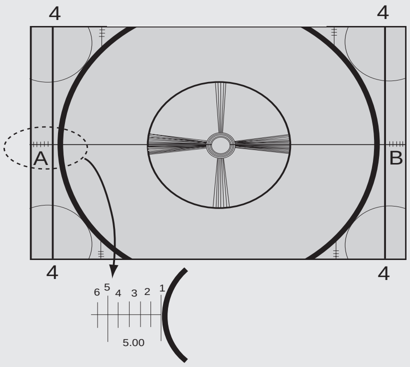


Figure 34. **H-Size Adjustment**

Note: *When using a different pattern, correlate with factory pattern.*

V-Size and V-Position Adjustment (D01 & D06)

Preparation:

1. Apply a Crosshatch pattern.

Procedure:

1. Apply a monoscope pattern.
2. Enter Serviceman Mode
3. Adjust (D06) to center the picture to the marks on the CRT.
4. Adjust (D01) to make circle of monoscope pattern a round circle.

V-Linearity Adjustment (D03)

Preparation:

1. Apply a Crosshatch pattern

Procedure:

1. Enter Serviceman Mode, Adjust linearity data “D03” so that interval of “a” is same as “b” (a=b). (See Fig. 35)

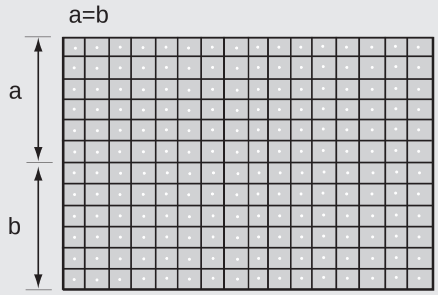


Figure 35. **Linearity adjustment**

V-Correction Adjustment (D02)

Preparation:

1. Apply a Crosshatch pattern.
2. Adjust (D01) so that V-Size is regular size.
3. If b-a<-1.5mm (in top and bottom), increase (D02) by one step and adjust (D01) so that V-Size is regular; repeat steps until b-a≤1.5mm
4. If b-a>-1.5mm (in top and bottom), decrease (D02) by one step and adjust (D01) so that V-Size is regular; repeat steps until b-a≤1.5mm.

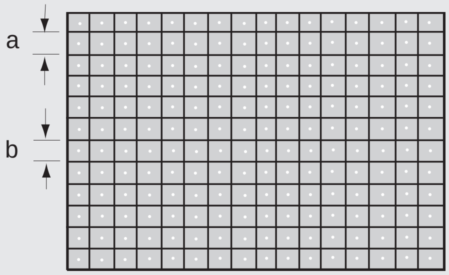


Figure 36. **V-Adjustment**

MTS Circuit Adjustments

The MTS Circuit Adjustments require two steps:

1. Input Level Adjustment.
2. Stereo Separation Adjustment.

Input Level Adjustment (M00)

Preparation:

1. Connect an RMS meter with filter jig as shown in Fig. 37.

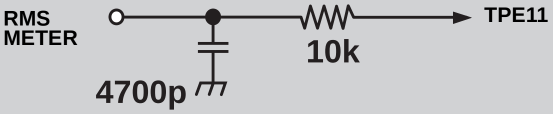


Figure 37. **Filter Jig**

2. Connect an RF signal generator to the RF antenna input.

Procedure:

1. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 100% modulation, monaural (70 ±5dB, 75Ω OPEN, P/S 10dB).
2. Adjust the MTS Input Level Adjustment (M0) until the voltage measured is 106 ± 6.0mV rms.

Stereo Separation Adjustment (M01 & M02)

Preparation:

1. Connect an RF signal generator to the RF antenna input.
2. Connect oscilloscope to TPE10.

Procedure:

1. Select Stereo Mode in Audio menu
2. Apply the following signal from the RF signal generator:
   Video: 100 IRE flat field, 30% modulation.
   Audio: 300Hz, 100% modulation, stereo (left only) (70 ±5dB, 75Ω OPEN, P/S 10dB).
3. Adjust the MTS Low-Level Separation Adjustment (M01) until the amplitude displayed on the scope is minimum.
4. Apply the following signal from the RF signal generator:

   Video: 100 IRE flat field, 30% modulation.
   Audio: 3KHz, 100% modulation, stereo (left only) (70 ±5dB, 75Ω OPEN, P/S 10dB).
5. Adjust the MTS High-Level Separation Adjustment (M02) until the amplitude displayed on the scope is minimum.
6. Repeat above steps 2 through 5 until the amplitude is minimum for both signals.

Service Adjustments (Electronic Controls, cont.)

Clock Adjustment (S07)

Preparation:

Connect the frequency counter to TPS1 (IC001 pin-13) and cold ground (⏚).

Note: *Frequency Counter probe capacitance should be 8pF or less.*

Procedure:

1. Measure TPS1 (IC001 pin 13) for the frequency of the waveform and record the reading.

Note: *Pin 13 measurement must have at least four digits of resolution following the decimal point. Example: 000.0000*

2. Place the Receiver into Serviceman Mode for making electronic adjustment, select the Clock Adjustment DAC (S07).
3. Calculate and set S07 based on the following formula:

$$S07 = 128 + \{873.90625 - pin13[Hz]\}968$$

Figure 38. **Set Turned ON**

$$S07 = 128 + \{218.47656 - pin13[Hz]\}3873$$

Figure 39. **Set Turned OFF**

Note: *Pin 13 measurement will not change regardless of the value stored in S07.*

Service Adjustments (Mechanical Controls)

Focus (part of T551)

This adjustment is to make the picture clear

Preparation:

Connect a Signal generator and select a dot pattern.

Procedure:

Adjust the FOCUS controls to obtain the sharpest and clearest dot pattern.

- a. Adjust VF1 to minimize width on vertical lines on corners.
- b. Adjust VF2 to minimize width on horizontal lines on corners.

Audio Signal Path Block Diagram

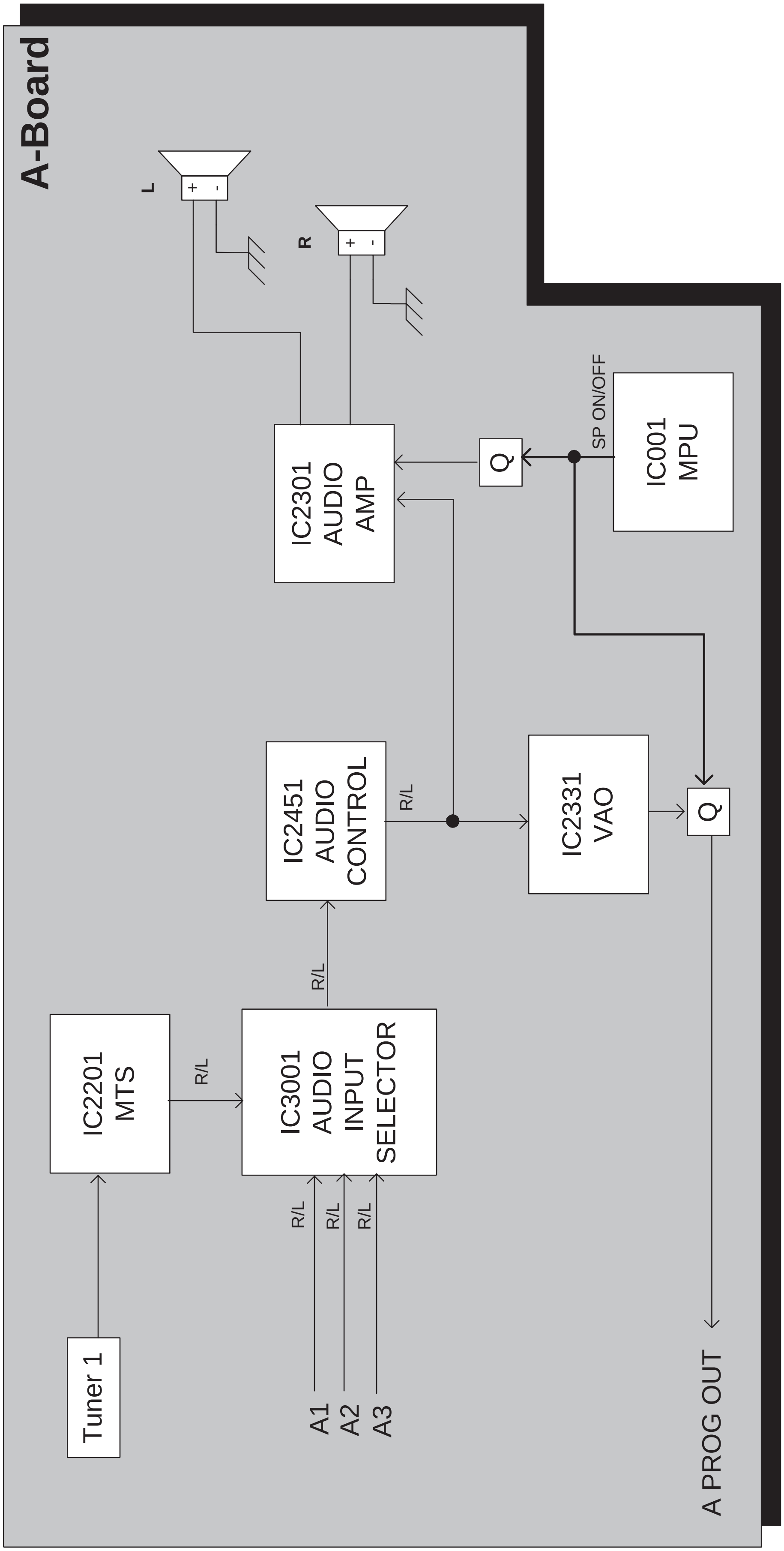

A-Board
L
+ -
R
+ -
IC2301 AUDIO AMP
Q
SP ON/OFF
IC001 MPU
IC2451 AUDIO CONTROL
R/L
IC2331 VAO
Q
R/L
IC2201 MTS
R/L
IC3001 AUDIO INPUT SELECTOR
R/L
R/L
R/L
Tuner 1
A1
A2
A3
A PROG OUT

Figure 40. **Audio Signal Path Block Diagram.**

Video Signal Path Block Diagram

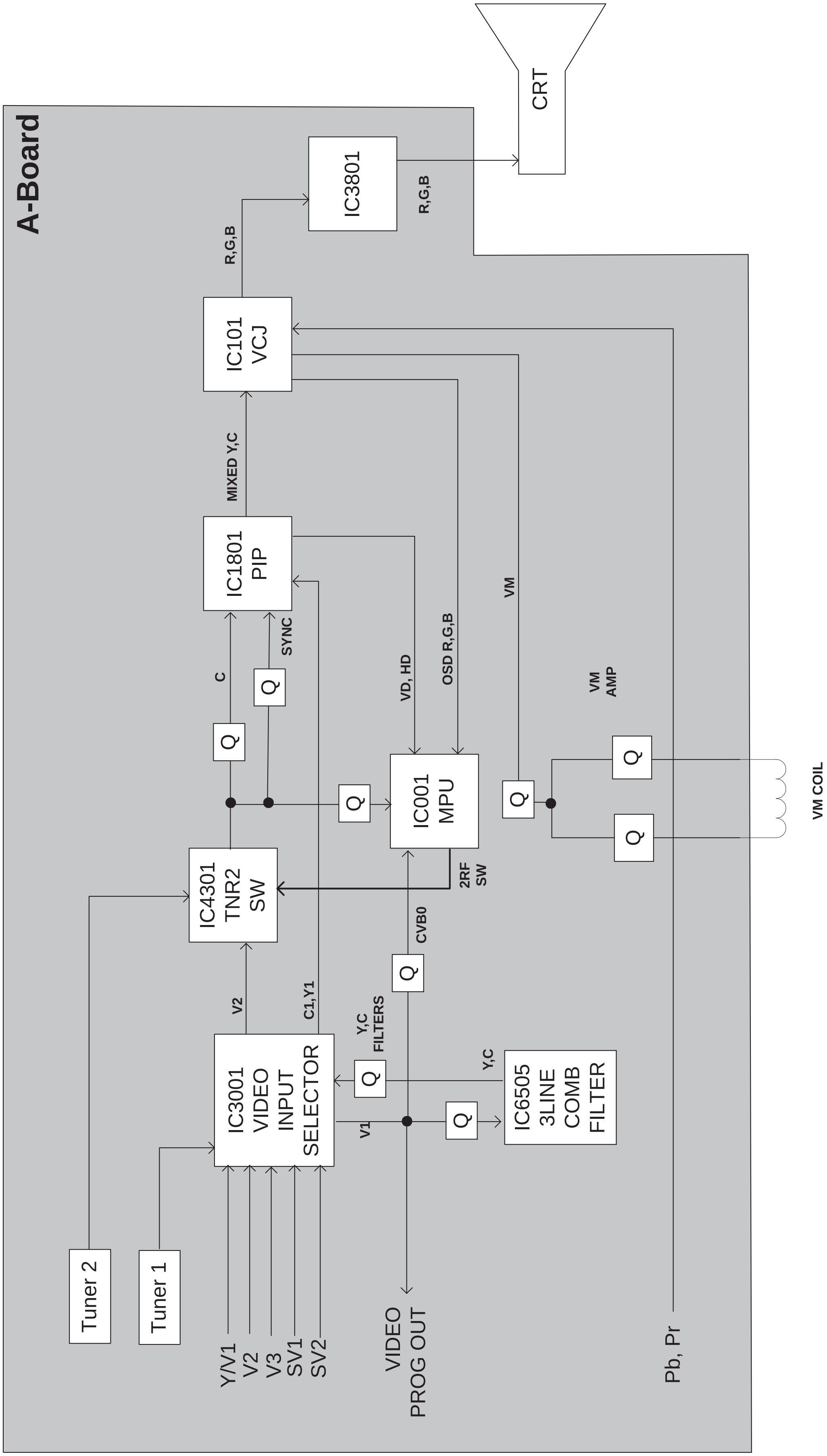

A-Board
CRT
IC3801
R,G,B
R,G,B
IC101
VCJ
MIXED Y,C
IC1801
PIP
C
SYNC
Q
Q
VD, HD
OSD R,G,B
VM
VM
AMP
Q
Q
Q
IC001
MPU
Q
VM COIL
IC4301
TNR2
SW
2RF
SW
CVB0
Q
V2
C1,Y1
Y,C
FILTERS
Y,C
IC3001
VIDEO
INPUT
SELECTOR
Q
V1
Q
IC6505
3LINE
COMB
FILTER
Tuner 2
Tuner 1
Y/V1
V2
V3
SV1
SV2
VIDEO
PROG OUT
Pb, Pr

Figure 41. **Video Signal Path Block Diagram.**

IIC Connection

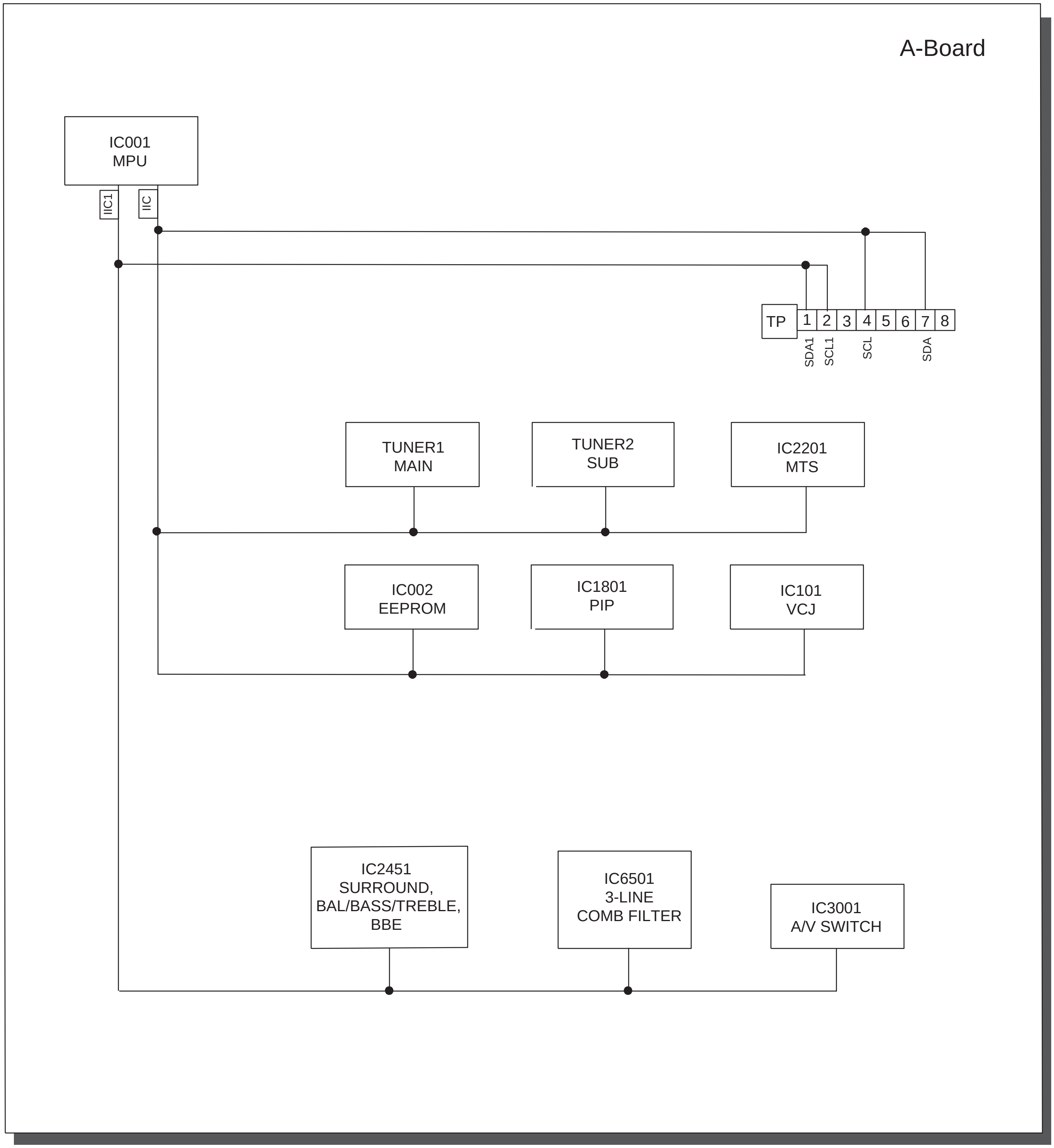

A-Board
IC001
MPU
IIC1
IIC
TP
1
2
3
4
5
6
7
8
SDA1
SCL1
SCL
SDA
TUNER1
MAIN
TUNER2
SUB
IC2201
MTS
IC002
EEPROM
IC1801
PIP
IC101
VCJ
IC2451
SURROUND,
BAL/BASS/TREBLE,
BBE
IC6501
3-LINE
COMB FILTER
IC3001
A/V SWITCH

Figure 42. **IIC Connection**

Description of Connectors

TP	
1	SDA1
2	SCL1
3	FA2
4	SCL
5	TP15
6	NC
7	SDA
8	FA1

A4---2RF	
1	9V
2	RF_SW

A15---DY	
1	V_LO
2	NC
3	V_HI

A11---L1	
1	VM_OUT
2	GND
3	R
4	G
5	B
6	GND
7	12V
8	GND

A1---G1	
1	STB_3.3V
2	REMOTE
3	KEY1
4	(KEY2/SOS) ACTION
5	GND
6	GND
7	STB_5V
8	9V
9	12V
10	GND

A7---D7	
1	TUNER GND
2	TUNER GND
3	TUNER GND
4	TUNER GND
5	SIGNAL GND
6	SIGNAL GND
7	FOCUS PROTECTER
8	HHS DET
9	FBP
10	ABL
11	SIGNAL GND
12	NC
13	SIGNAL GND
14	NC
15	SIGNAL GND
16	V_PUMP UP

A6---D6	
1	EHT_V
2	H_GND
3	EW_DRIVE
4	H_GND
5	H_DRIVE
6	H_GND
7	SIGMA GND
8	UNREG -15V
9	UNREG -15V
10	UNREG +15V
11	UNREG +15V
12	+12V
13	SIGNAL GND
14	+9V
15	UNREG +11V
16	UNREG +11V

A5---D5	
1	POWER GND
2	POWER GND
3	UNREG +11V
4	UNREG +11V
5	BTL +30V
6	SIGNAL GND
7	STB_12V
8	SIGNAL GND
9	AC ON/OFF
10	DEG ON/OFF
11	SOS
12	SIGNAL GND
13	AUDIO +30V
14	AUDIO +30V
15	AUDIO GND
16	AUDIO GND

A2---G2	
1	GND
2	NC
3	NC
4	GEOMAG
5	GND
6	NC
7	NC
8	GND
9	S3
10	NC

A3---G3	
1	NC
2	L3
3	NC
4	R3
5	GND
6	GND
7	SP (R)
8	GND
9	GND
10	SP (L)

IC101 IN/OUT Pins and Functions (VCJ)

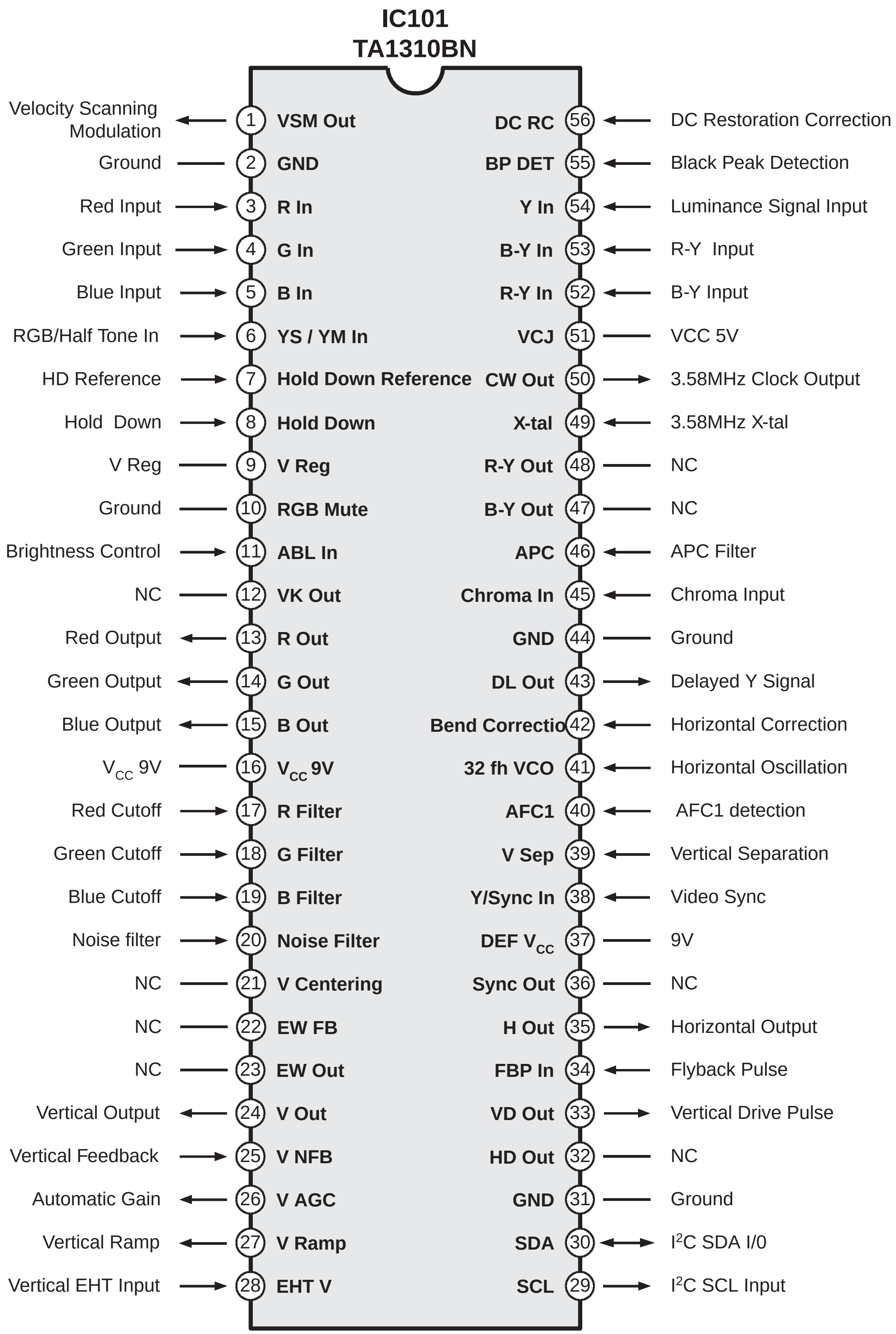

IC101
TA1310BN
Velocity Scanning Modulation
1 VSM Out
DC RC 56
DC Restoration Correction
Ground
2 GND
BP DET 55
Black Peak Detection
Red Input
3 R In
Y In 54
Luminance Signal Input
Green Input
4 G In
B-Y In 53
R-Y Input
Blue Input
5 B In
R-Y In 52
B-Y Input
RGB/Half Tone In
6 YS / YM In
VCJ 51
VCC 5V
HD Reference
7 Hold Down Reference
CW Out 50
3.58MHz Clock Output
Hold Down
8 Hold Down
X-tal 49
3.58MHz X-tal
V Reg
9 V Reg
R-Y Out 48
NC
Ground
10 RGB Mute
B-Y Out 47
NC
Brightness Control
11 ABL In
APC 46
APC Filter
NC
12 VK Out
Chroma In 45
Chroma Input
Red Output
13 R Out
GND 44
Ground
Green Output
14 G Out
DL Out 43
Delayed Y Signal
Blue Output
15 B Out
Bend Correctio 42
Horizontal Correction
V$_{CC}$ 9V
16 V$_{CC}$ 9V
32 fh VCO 41
Horizontal Oscillation
Red Cutoff
17 R Filter
AFC1 40
AFC1 detection
Green Cutoff
18 G Filter
V Sep 39
Vertical Separation
Blue Cutoff
19 B Filter
Y/Sync In 38
Video Sync
Noise filter
20 Noise Filter
DEF V$_{CC}$ 37
9V
NC
21 V Centering
Sync Out 36
NC
NC
22 EW FB
H Out 35
Horizontal Output
NC
23 EW Out
FBP In 34
Flyback Pulse
Vertical Output
24 V Out
VD Out 33
Vertical Drive Pulse
Vertical Feedback
25 V NFB
HD Out 32
NC
Automatic Gain
26 V AGC
GND 31
Ground
Vertical Ramp
27 V Ramp
SDA 30
I^{2}C SDA I/0
Vertical EHT Input
28 EHT V
SCL 29
I^{2}C SCL Input

Figure 43. **IC101 IN/OUT Pins and Functions (VCJ).**

Component Identification

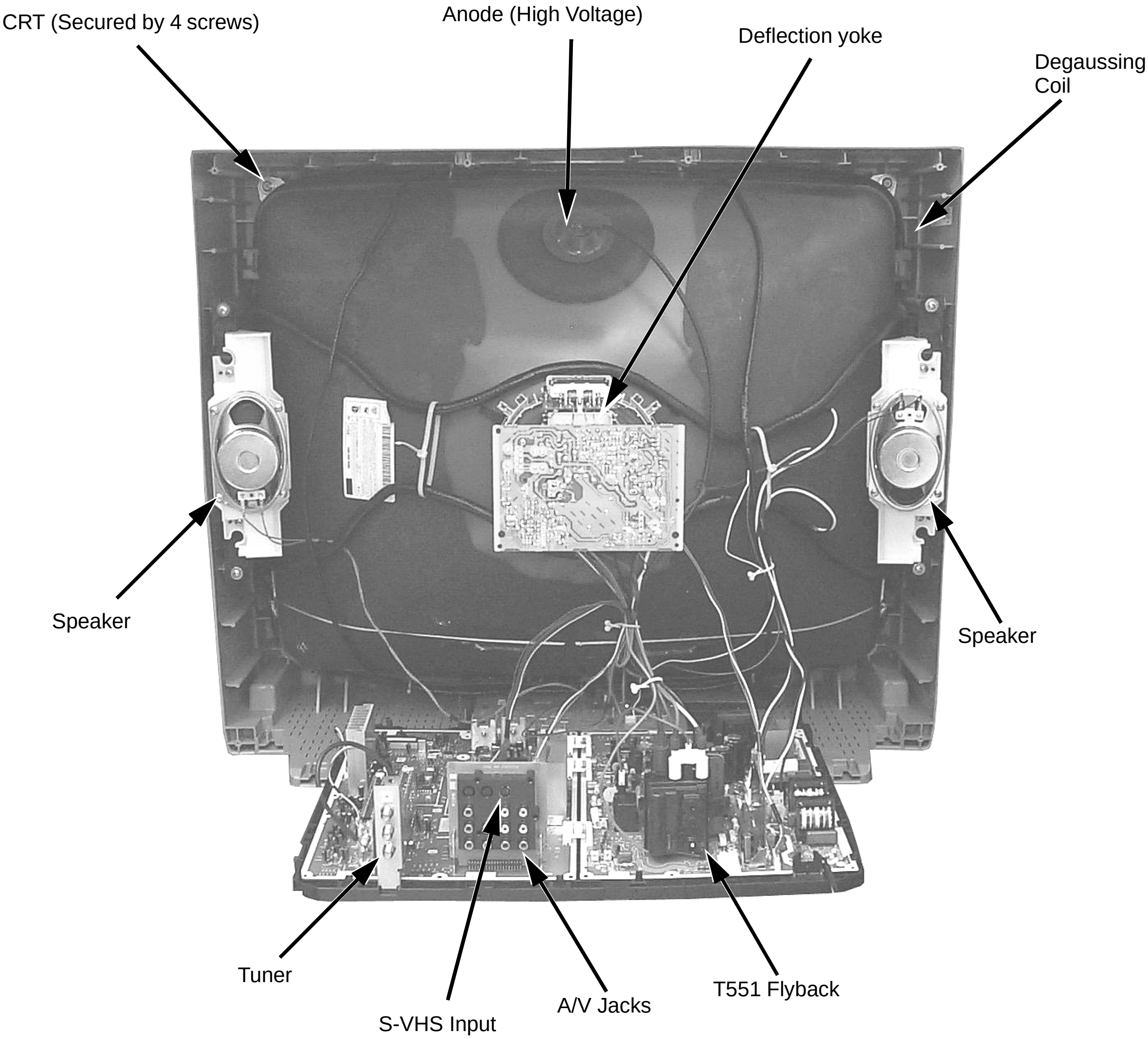

CRT (Secured by 4 screws)
Anode (High Voltage)
Deflection yoke
Degaussing Coil
Speaker
Speaker
Tuner
S-VHS Input
A/V Jacks
T551 Flyback

Figure 44. **Rear View**

Component Identification

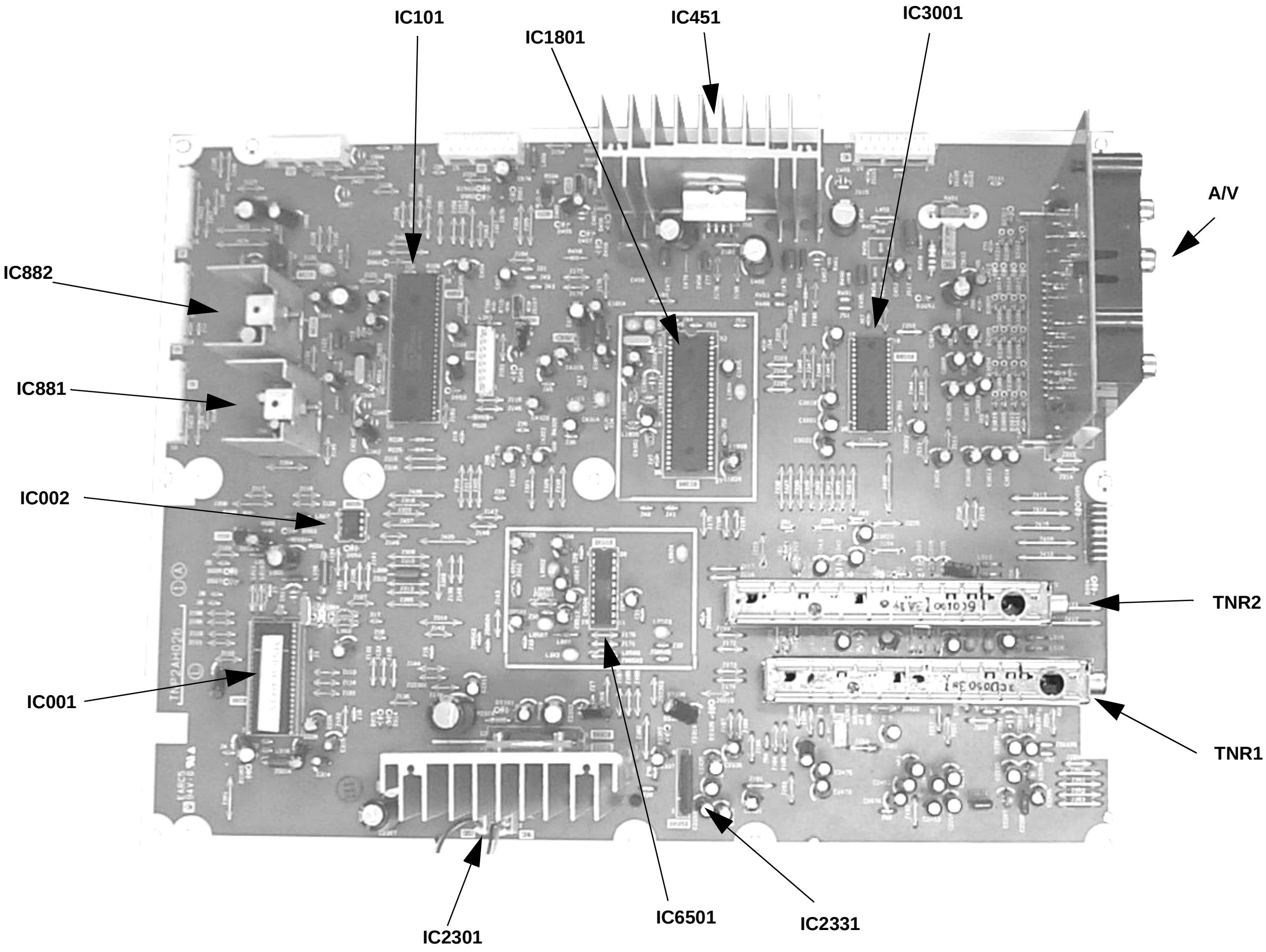

IC101
IC1801
IC451
IC3001
A/V
IC882
IC881
IC002
TNR2
IC001
TNR1
IC2301
IC6501
IC2331

Figure 45. **A-Board**

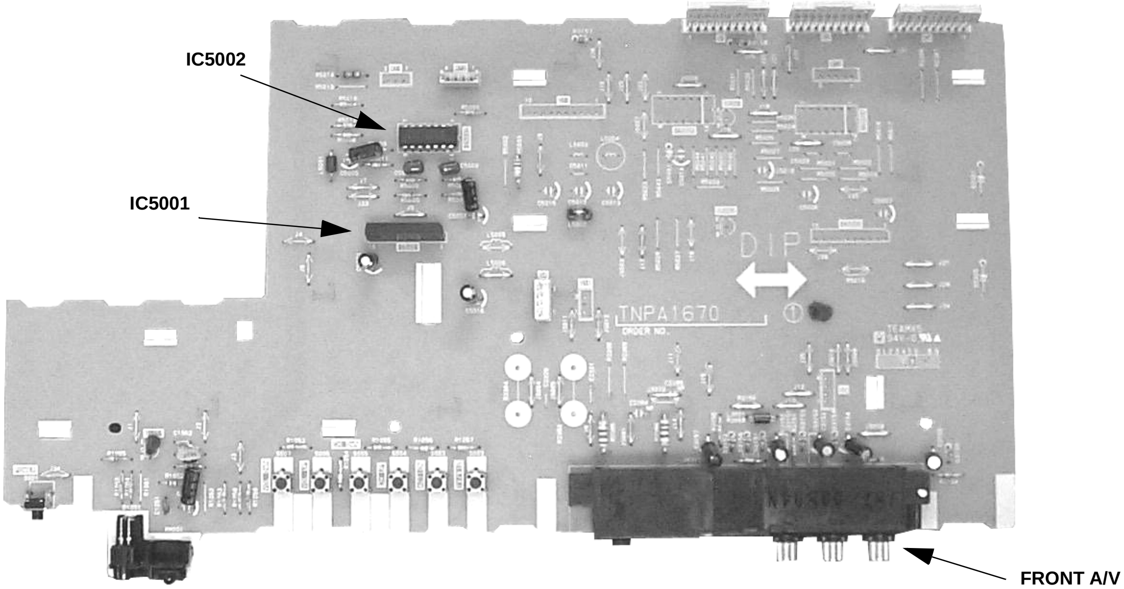

IC5002
IC5001
FRONT A/V

Figure 46. **G-Board**

Component Identification

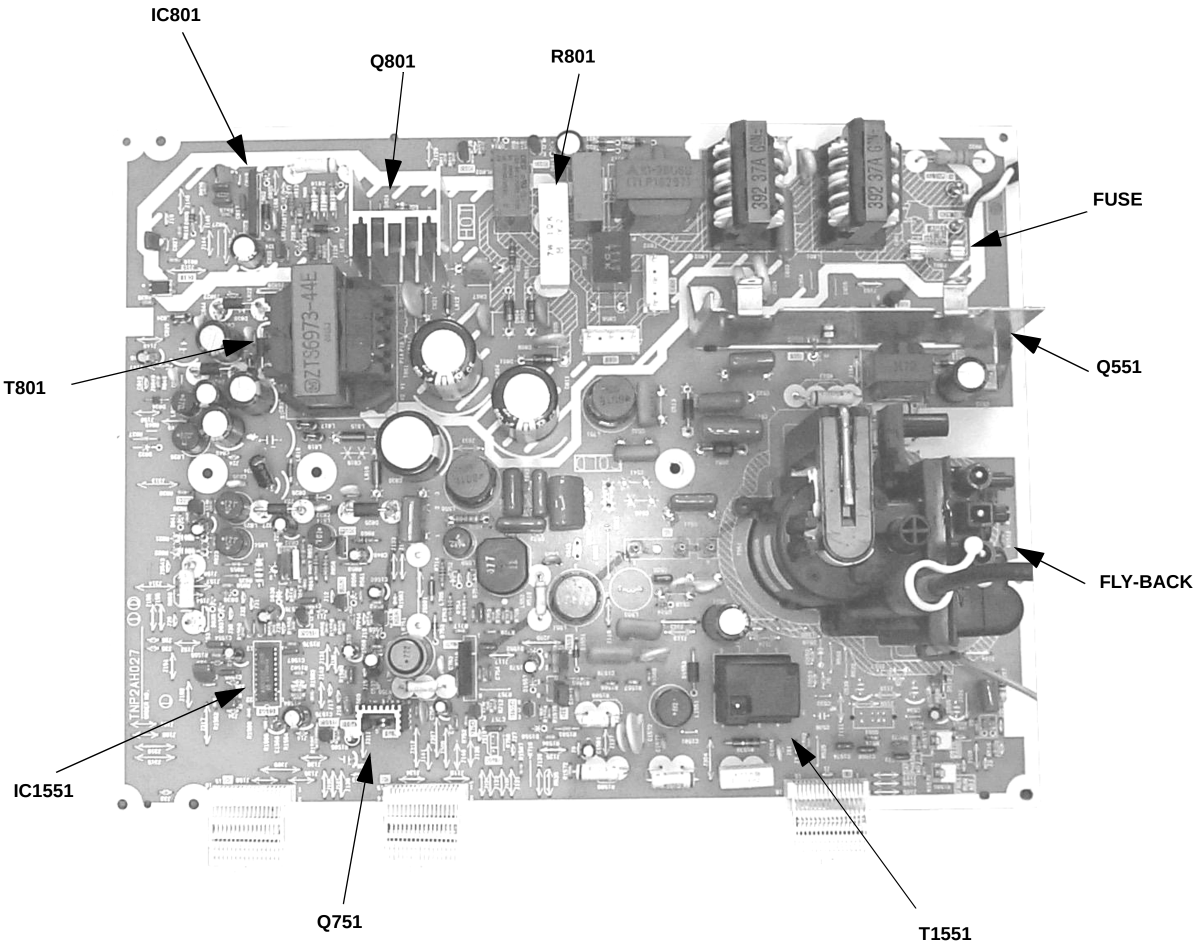

IC801
Q801
R801
FUSE
Q551
T801
FLY-BACK
IC1551
Q751
T1551

Figure 47. **D-Board**

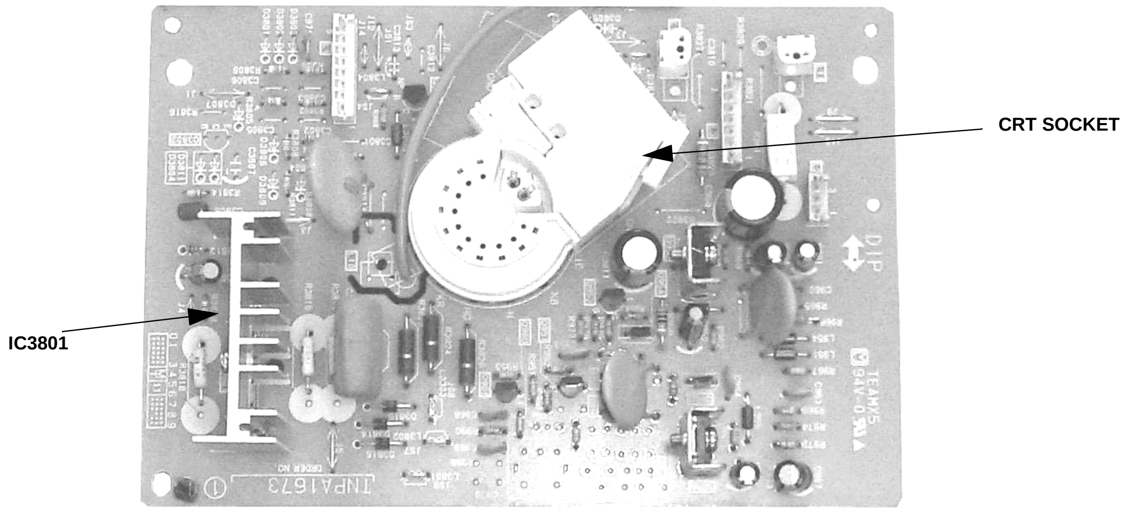

CRT SOCKET
IC3801

Figure 48. **L-Board**

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
	CAPACITORS	
C001	ECA1CM470B	CAP,E 47UF/16V
C002	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C005	ECA1CM470B	CAP,E 47UF/16V
C006	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C008	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C009	TCJ2VC1H101J	CAP,C 100PF-J-50V
C010	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C012	ECA1HM220B	CAP,E 22UF-50V
C013	ECA0JM101B	CAP,E 100UF-6.3V
C014	TCJ2VC1H390J	CAP,C 39PF-J-50V
C015	TCJ2VC1H120J	CAP,C 12PF-J-50V
C017	TCJ2VC1H270J	CAP,C 27PF-J-50V
C018	TCJ2VC1H270J	CAP,C 27PF-J-50V
C020	ECA0JM331B	CAP,E 330UF-6.3V
C024	ECA1HM4R7B	CAP,E 4.7UF-50V
C025	ECA1HM010B	CAP,E 1UF-50V
C026	ECA1HM010B	CAP,E 1UF-50V
C033	TCJ2VC1H680J	CAP,C 68PF-J-50V
C034	TCJ2VC1H680J	CAP,C 68PF-J-50V
C043	ECA1HM2R2B	CAP,E 2.2UF-50V
C044	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C045	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C047	ECA0JM102B	CAP,E 1000UF-6.3V
C048	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C049	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C058	ECA1CM470B	CAP,E 47UF/16V
C059	ECA1HM4R7B	CAP,E 4.7UF-50V
C060	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C061	ECA1HM2R2B	CAP,E 2.2UF-50V
C062	ECA1CM470B	CAP,E 47UF/16V
C064	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C081	ECA1HM010B	CAP,E 1UF-50V
C201	TCJ2VB1C104K	CAP,C .1UF-K-16V
C224	TCJ2VB1C104K	CAP,C .1UF-K-16V
C225	TCJ2VB1C104K	CAP,C .1UF-K-16V
C226	TCJ2VB1C104K	CAP,C .1UF-K-16V
C301	TCJ2VB1C104K	CAP,C .1UF-K-16V
C302	TCJ2VB1C104K	CAP,C .1UF-K-16V
C303	TCJ2VB1C104K	CAP,C .1UF-K-16V
C307	ECA1HM0R1B	CAP,E 0.1UF/50V
C309	TCJ2VC1H390J	CAP,C 39PF-J-50V
C310	TCJ2VC1H390J	CAP,C 39PF-J-50V
C314	EEANA1E1R0B	CAP,E 1.0UF-25V
C315	EEANA1E1R0B	CAP,E 1.0UF-25V
C320	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C321	TCJ2VB1H103K	CAP,C .01UF-K-50V
C322	TCJ2VB1H103K	CAP,C .01UF-K-50V
C323	TCJ2VB1H103K	CAP,C .01UF-K-50V
C324	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REF NO.	PART NO.	DESCRIPTION
C330	ECA1AM101B	CAP,E 100UF-10V
C331	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C337	ECA1HM2R2B	CAP,E 2.2UF-50V
C342	ECA1HM010B	CAP,E 1UF-50V
C401	TCJ2VB1C104K	CAP,C .1UF-K-16V
C402	TCJ2VB1H102K	CAP,C .001UF-K-50V
C403	ECA1HM010B	CAP,E 1UF-50V
C404	ECA1HM010B	CAP,E 1UF-50V
C405	ECSF1EE105VB	CAP,E 1.0UF-25V
C407	ECA1HM220B	CAP,E 22UF-50V
C409	TCJ2VC1H101J	CAP,C 100PF-J-50V
C410	TCJ2VB1C104K	CAP,C .1UF-K-16V
C415	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C453	EEUNA1E220B	CAP,E 22UF-25V
C454	ECA1HHG221B	CAP,E 220UF-50V
C456	ECQB1104JF3	CAP,P .10UF-J-100V
C458	ECQB1H472JM3	CAP,P 4700PF-J-50V
C459	ECQB1224KF3	CAP,P .22UF-K-100V
C460	ECA1EM102E	CAP,E 1000UF-25V
C462	ECA1EM102E	CAP,E 1000UF-25V
C463	ECQB1H103JM3	CAP,P .01UF-J-50V
C465	ECA1CM101B	CAP,E 100UF/16V
C470	ECQB1H104JM3	CAP,P .1UF-J-50V
C471	ECQB1H104JM3	CAP,P .1UF-J-50V
C495	ECQB1H683JM3	CAP,P .063UF-J-50V
C501	ECQB1H222JM3	CAP,P 2200PF-J-50V
C502	ECA1HMR22B	CAP,E .22UF-50V
C504	ECKR2H152KB5	CAP,C .0015UF-K-500V
C505	TCJ2VC1H180J	CAP,C 18PF-J-50V
C506	ECA1CM471B	CAP,E 470UF-16V
C507	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C508	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C509	ECKR3A681KBP	CAP,C 680PF-K-1KV
C510	TCJ2VC1H101J	CAP,C 100PF-J-50V
C511	**ECWH20242JVY**	**CAP,P 2400PF-J-2KV**
C512	ECKR2H332KB5	CAP,C 3300PF-K-550V
C513	**ECQF4273JZH**	**CAP,P .027UF-J-400V**
C514	**ECWH20133JVB**	**CAP,P 13000PF-J-2KV**
C518	**ECKW3D681KBR**	**CAP,C 680PF-K-2KV**
C519	**ECKW3D681KBR**	**CAP,C 680PF-K-2KV**
C520	**ECQB1H153JM3**	**CAP,P .015UF-J-50V**
C522	**ECWH20182JVY**	**CAP,P 1800PF-J-2KV**
C524	ECQB1224JF3	CAP,P .22UF-J-100V
C526	ECA2EM470E	CAP,E 47UF-250V
C527	ECKR2H102KB5	CAP,C 1000PF-K-500V
C528	**ECA1HM4R7B**	**CAP,E 4.7UF-50V**
C531	**ECA160V33UE**	**CAP,E 33UF/160V**
C532	**ECQF4183JZH**	**CAP,P .018UF-J-400V**
C537	ECEA2CNR47SB	CAP,E .47UF-160V
C553	ECWF2105JSR	CAP,P .1UF-J-200V *CT-36SX31E/CE/UE*

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer’s specified parts.

REF NO.	PART NO.	DESCRIPTION
C553	ECWF2125JSR	CAP,M .21UF-J-200V *CT-32SX31E/CE/UE*
C554	ECA1AM222E	CAP,E 2200UF-10V
C555	TCJ2VB1H103K	CAP,C .01UF-K-50V
C557	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C569	ECWF2394JSR	CAP,M .39UF-J-200V
C572	ECWF2334JSR	CAP,M .33UF-J-200V *CT-32SX31E/CE/UE*
C572	ECWF2474JSR	CAP,P .47UF-J-200V *CT-36SX31E/CE/UE*
C573	ECQE2474KFB	CAP,P .47UF-K-200V
C574	ECA1HM470B	CAP,E 47UF-50V
C575	ECQV1H334JL3	CAP,P .33UF-J-50V
C595	ECA1HM100B	CAP,E 10UF/50V
C601	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C603	ECQB1H223JM3	CAP,P .022UF-J-50V
C616	TCJ2VB1C104K	CAP,C .1UF-K-16V
C619	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C628	TCJ2VC1H151J	CAP,C 150PF-J-50V
C632	TCJ2VB1H103K	CAP,C .01UF-K-50V
C641	ECA1HM100B	CAP,E 10UF/50V
C701	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C750	TACCW181T50V	CAP,C 180PF/50V
C751	ECQE1335KFB	CAP,P 3.3UF-K-100V
C752	ECA1VM470B	CAP,E 47UF/35V
C753	ECQB1H222JM3	CAP,P 2200PF-J-50V
C754	TACCW332T50V	CAP,C .0033UF/50V
C755	ECQB1H273JM3	CAP,M .27UF-J-50V
C756	ECKR2H332KB5	CAP,C 3300PF-K-550V
C757	ECQB1H682JM3	CAP,P 6800PF-J-50V
C763	ECKR3A121KBP	CAP,C 120PF-K-1KV
C801	**ECQU2A224MVA**	**CAP,P .22UF-M-250VAC**
C802	**ECQU2A823MNB**	**CAP,P .082UF-M-250VAC**
C803	ECQB1H222JM3	CAP,P 2200PF-J-50V
C804	**EC0S2DA821DB**	**CAP,E 820UF-200V**
C805	**ECKW2H472PU7**	**CAP,C 4700PF-P-500V**
C806	**ECKW2H472PU7**	**CAP,C 4700PF-P-500V**
C807	**ECKW2H472PU7**	**CAP,C 4700PF-P-500V**
C808	**ECKW2H472PU7**	**CAP,C 4700PF-P-500V**
C809	ECQB1H333JM3	CAP,P .033UF-J-50V
C810	ECQB1H102JM3	CAP,P 1000PF-J-50V
C811	**EC0S2DA821DB**	**CAP,E 820UF-200V**
C815	ECA1EM471B	CAP,E 470UF-25V
C817	ECQB1H332JM3	CAP,P 3300PF-J-50V
C819	TACCQ221T50V	CAP,C 220PF/50V
C820	ECA1EHG471B	CAP,E 470UF-25V
C821	ECKW3D222KBP	CAP,C 2200UF-K-2KVDC
C822	ECQB1H393JM3	CAP,P .039UF-J-50V
C826	ECA1CM222E	CAP,E 2200UF-16V
C827	ECQB1H333JM3	CAP,P .033UF-J-50V
C829	ECA1HHG102E	CAP,E 1000UF-50V
C830	**EC0S2CA102CB**	**CAP,E 1000UF-160V**
C831	ECKR3A102KBP	CAP,C 1000PF-K-1KV
C832	ECA1CM221B	CAP,E 220UF-16V
C833	ECKR3A471KBP	CAP,C 470PF-K-1KV
C834	ECA1CM332E	CAP,E 3300UF-16V
C836	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C837	ECA1EM222E	CAP,E 2200UF-25V
C839	ECKR3A151KBP	CAP,C 150PF-K-1KV
C840	ECA1EM222E	CAP,E 2200UF-25V
C841	ECA1EM102E	CAP,E 1000UF-25V
C842	ECKR3A331KBP	CAP,C 330PF-K-1KVDC
C843	ECA1VM102E	CAP,E 1000UF-35V
C844	ECKR3A471KBP	CAP,C 470PF-K-1KV
C845	ECA1CM101B	CAP,E 100UF/16V
C846	ECA1HM010B	CAP,E 1UF-50V
C848	ECA1CM101B	CAP,E 100UF/16V
C852	**ECKCNB102MB**	**CAP,C 1000PF-M-250V**
C853	**ECKCNB102MB**	**CAP,C 1000PF-M-250V**
C854	**ECKCNB472ME**	**CAP,C 4700PF-M-250V**
C855	**ECKCNB472ME**	**CAP,C 4700PF-M-250V**
C881	ECA1CM101B	CAP,E 100UF/16V
C883	ECA1CM101B	CAP,E 100UF/16V
C885	ECA1CM471B	CAP,E 470UF-16V
C886	ECA1CM102B	CAP,E 1000UF/16V
C888	ECA1CM471B	CAP,E 470UF-16V
C889	ECA1CM221B	CAP,E 220UF-16V
C895	ECA1EM101B	CAP,E 100UF-25V
C904	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C952	ECA1HM100B	CAP,E 10UF/50V
C953	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C958	ECA2CM470E	CAP,E 47UF-160V
C959	ECKW2H103KB5	CAP,C .01UF-K-500V
C960	ECCR2H151J5	CAP,C 150-500V
C961	ECA2AM100B	CAP,E 10UF-100V
C962	ECKW2H103KB5	CAP,C .01UF-K-500V
C963	ECCR1H151J5	CAP DISC 150-5-50V
C964	ECA1CHG101B	CAP,E 100UF-16V
C966	ECA1CHG101B	CAP,E 100UF-16V
C967	ECA1CM221B	CAP,E 220UF-16V
C968	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C969	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C971	ECKR1H222KB5	CAP,C 2200PF-K-50V
C1051	TACCX103T50V	CAP,C .01UF/50V
C1052	ECA1HM470B	CAP,E 47UF-50V
C1063	ECCR1H101JC5	CAP,C 100PF-J-50V
C1552	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C1553	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C1554	ECQB1H222JM3	CAP,P 2200PF-J-50V
C1555	ECQB1H103JM3	CAP,P .01UF-J-50V
C1556	ECSF1CE225VB	CAP,E 2.2UF-16V
C1557	ECQV1H224JL3	CAP,P .22UF-J-50V

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C1558	ECQB1H104JM3	CAP,P .1UF-J-50V
C1559	ECQB1H333JM3	CAP,P .033UF-J-50V
C1560	ECA1HM100B	CAP,E 10UF/50V
C1561	ECA1HM010B	CAP,E 1UF-50V
C1562	ECQM4223KZW	CAP,P .022UF-K-400V
C1563	ECKW3D152KBR	CAP,C 1500PF-K-2KV
C1564	ECKR3A102KBP	CAP,C 1000PF-K-1KV
C1565	ECQB1H103JM3	CAP,P .01UF-J-50V
C1566	ECQB1H222JM3	CAP,P 2200PF-J-50V
C1567	ECQB1H103JM3	CAP,P .01UF-J-50V
C1568	ECA1HM010B	CAP,E 1UF-50V
C1569	ECQK1562JZ3	CAP,P .0056UF-J-100V
C1570	ECA1HM2R2B	CAP,E 2.2UF-50V
C1571	ECKR2H471KB5	CAP,C 470PF-K-500W
C1572	ECKW3A472KBP	CAP,C 4700PF-K-1KV
C1573	ECQB1H822JM3	CAP,P 8200PF-J-50V
C1574	ECQB1H333JM3	CAP,P .033UF-J-50V
C1575	ECA1CM471B	CAP,E 470UF-16V
C1576	ECA1HM2R2B	CAP,E 2.2UF-50V
C1577	ECKR2H471KB5	CAP,C 470PF-K-500W
C1578	ECQM4223KZW	CAP,P .022UF-K-400V
C1579	ECA1HM100B	CAP,E 10UF/50V
C1580	ECKW3A222KBP	CAP,C 2200PF-K-1KV
C1801	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1802	ECQV1H154JL3	CAP,P.15UF-J-50V
C1803	ECA1HMR22B	CAP,E .22UF-50V
C1804	ECA1HMR22B	CAP,E .22UF-50V
C1805	ECJ2VF1H333Z	CAP,C .033UF-Z-50V
C1806	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1807	ECA1AM470B	CAP,E 47UF-10V
C1808	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1809	ECA1AM470B	CAP,E 47UF-10V
C1810	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1811	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1812	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1813	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1815	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1816	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1817	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1818	ECA1CM100B	CAP,E 10UF-16V
C1819	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1820	ECA1AM470B	CAP,E 47UF-10V
C1821	TCJ2VC1H150J	CAP,C 15PF-J-50V
C1822	TCJ2VC1H120J	CAP,C 12PF-J-50V
C1823	TCJ2VC1H680J	CAP,C 68PF-J-50V
C1826	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1827	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1828	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C1829	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1830	TCJ2VC1H151J	CAP,C 150PF-J-50V
C1831	ECJ2VF1H104Z	CAP,C .1UF-Z-50V

REF NO.	PART NO.	DESCRIPTION
C1832	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1833	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1835	ECA1CM100B	CAP,E 10UF-16V
C1836	TCJ2VC1H470J	CAP,C 47PF-J-50V
C1837	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C1841	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C2202	ECA1HM2R2B	CAP,E 2.2UF-50V
C2203	ECA1HM4R7B	CAP,E 4.7UF-50V
C2204	AP106K016CAE	CAP,T 10UF/16V
C2205	ECA1HM010B	CAP,E 1UF-50V
C2206	ECQB1H223JM3	CAP,P .022UF-J-50V
C2207	AP335K016CAE	CAP,T 3.3UF/16V
C2208	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2209	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2210	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2211	ECA1CM100B	CAP,E 10UF-16V
C2212	ECQB1H473JM3	CAP,P .047UF-J-50V
C2215	ECA0JM101B	CAP,E 100UF-6.3V
C2218	ECA1HMR47B	CAP,E .47UF-50V
C2219	TCJ2VC1H100D	CAP,C 10PF-D-50V
C2302	ECA1HM010B	CAP,E 1UF-50V
C2303	TCJ2VB1H332K	CAP,C .0033UF-K-50V
C2304	TCJ2VB1H332K	CAP,C .0033UF-K-50V
C2305	ECA1HM010B	CAP,E 1UF-50V
C2307	ECA1EM102E	CAP,E 1000UF-25V
C2308	ECA1HM101B	CAP,E 100UF-50V
C2311	ECA1HM010B	CAP,E 1UF-50V
C2312	ECA1EM102E	CAP,E 1000UF-25V
C2313	ECA1VM472E	CAP,E 4700UF-35V
C2314	ECA1EM221B	CAP,E 220UF-25V
C2331	ECA1HM010B	CAP,E 1UF-50V
C2332	ECA1HM010B	CAP,E 1UF-50V
C2333	ECA1EM100B	CAP,E 10UF-25V
C2334	ECA1EM100B	CAP,E 10UF-25V
C2335	ECA1HM010B	CAP,E 1UF-50V
C2336	ECA1HM010B	CAP,E 1UF-50V
C2337	ECA1CM470B	CAP,E 47UF/16V
C2431	TCJ2VF1C105Z	CAP,C 1.0UF-Z-16V
C2432	TCJ2VF1C105Z	CAP,C 1.0UF-Z-16V
C2433	TCJ2VC1H222J	CAP,C .0022UF-J-50V
C2437	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2438	TCJ2VB1H102K	CAP,C .001UF-K-50V
C2444	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2445	TCJ2VB1C104K	CAP,C .1UF-K-16V
C2449	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2450	TCJ2VB1H102K	CAP,C .001UF-K-50V
C2451	ECEA1CN100UB	CAP,E 10UF-16V
C2459	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2460	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2461	ECA1HM4R7B	CAP,E 4.7UF-50V
C2462	ECA1HM4R7B	CAP,E 4.7UF-50V

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
C2463	ECEA1CN100UB	CAP,E 10UF-16V
C2464	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2465	TCJ2VB1H333K	CAP,C .033UF-K-50V
C2468	ECA1CM101B	CAP,E 100UF/16V
C2473	ECA1HM4R7B	CAP,E 4.7UF-50V
C2474	ECA1CM101B	CAP,E 100UF/16V
C2475	ECA1HM4R7B	CAP,E 4.7UF-50V
C3001	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3002	ECA1AM101B	CAP,E 100UF-10V
C3003	ECA1CM100B	CAP,E 10UF-16V
C3004	ECA1HM010B	CAP,E 1UF-50V
C3006	ECA1HM010B	CAP,E 1UF-50V
C3007	ECA1CM100B	CAP,E 10UF-16V
C3008	ECA1CM100B	CAP,E 10UF-16V
C3009	ECA1HM010B	CAP,E 1UF-50V
C3010	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3011	ECA1HM010B	CAP,E 1UF-50V
C3012	ECA1CM100B	CAP,E 10UF-16V
C3013	ECA1CM100B	CAP,E 10UF-16V
C3014	ECA1HM010B	CAP,E 1UF-50V
C3015	ECA1HM010B	CAP,E 1UF-50V
C3016	ECA1HM010B	CAP,E 1UF-50V
C3018	ECA1CM100B	CAP,E 10UF-16V
C3019	ECA1CM100B	CAP,E 10UF-16V
C3020	ECA1HM010B	CAP,E 1UF-50V
C3021	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3022	ECA1HM010B	CAP,E 1UF-50V
C3023	ECA1CM100B	CAP,E 10UF-16V
C3024	ECA1CM100B	CAP,E 10UF-16V
C3025	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C3054	ECA1CM471B	CAP,E 470UF-16V
C3154	ECA1HM010B	CAP,E 1UF-50V
C3155	ECA1HM010B	CAP,E 1UF-50V
C3807	ECA1CM221B	CAP,E 220UF-16V
C3808	ECQV1H224JL3	CAP,P .22UF-J-50V
C3809	ECQM4104KZB	CAP,P .10UF-K-400V
C3811	ECA2EM100B	CAP,E 10UF/250V
C3814	ECKC3D332KBN	CAP,C 3300PF-K-2KV
C4301	ECKR1H103ZF5	CAP,C .01UF-Z-50V
C4302	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C4304	ECA1CM100B	CAP,E 10UF-16V
C4310	TCJ2VC1H390J	CAP,C 39PF-J-50V
C4313	TCJ2VC1H561J	CAP,C 560PF-J-50V
C4314	ECA1HMR47B	CAP,E .47UF-50V
C4315	TCJ2VB1H152K	CAP,C .0015UF-K-50V
C4316	ECA0JM331B	CAP,E 330UF-6.3V
C4317	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C4318	ECA0JM101B	CAP,E 100UF-6.3V
C4319	TCJ2VC1H391J	CAP,C 390PF-J-50V
C4320	TCJ2VB1H681K	CAP,C 680PF-K-50V
C4322	ECA1CM100B	CAP,E 10UF-16V
C4323	ECA0JM101B	CAP,E 100UF-6.3V
C4324	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C4325	ECA1CM100B	CAP,E 10UF-16V
C5001	ECA1HM4R7B	CAP,E 4.7UF-50V
C5002	ECA1HM4R7B	CAP,E 4.7UF-50V
C5003	ECQV1H334JL3	CAP,P .33UF-J-50V
C5004	ECQV1H334JL3	CAP,P .33UF-J-50V
C5005	ECA1VM470B	CAP,E 47UF/35V
C5016	ECA1HM100B	CAP,E 10UF/50V
C6501	ECA0JM101B	CAP,E 100UF-6.3V
C6502	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6503	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6504	ECA1CM470B	CAP,E 47UF/16V
C6505	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6506	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6507	ECEA1HNR47UB	CAP,E .47UF-50V
C6508	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6509	ECA1CM470B	CAP,E 47UF/16V
C6510	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6511	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6512	ECA1CM470B	CAP,E 47UF/16V
C6513	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6514	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6515	ECJ2VF1H104Z	CAP,C .1UF-Z-50V
C6516	ECA1CM470B	CAP,E 47UF/16V
C6517	TCJ2VC1H181J	CAP,C 180PF-J-50V
C6518	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6519	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6520	ECA1CM470B	CAP,E 47UF/16V
C6521	TCJ2VC1H220J	CAP,C 22PF-J-50V
C6522	TCJ2VC1H180J	CAP,C 18PF-J-50V
C6523	TCJ2VC1H120J	CAP,C 12PF-J-50V
C6525	TCJ2VC1H120J	CAP,C 12PF-J-50V
C6526	TCJ2VC1H270J	CAP,C 27PF-J-50V
C6532	TCJ2VF1H103Z	CAP,C .01UF-Z-50V
C6570	TCJ2VC1H050D	CAP,C 5PF-D-50V
C6571	TCJ2VC1H560J	CAP,C 56PF-J-50V
DIODES		
D003	MA4056MTA	DIODE
D006	MA4300HTA	DIODE
D007	MA4030HTA	DIODE
D014	MA165TA5VT	DIODE, SWITCHING
D015	MA700ATA	DIODE
D051	MA4062MTA	DIODE, ZENER
D240	MA165TA5VT	DIODE, SWITCHING
D451	ERA15-02V3	DIODE
D455	MA165TA5VT	DIODE, SWITCHING
D504	MA4300LTA	DIODE
D509	MA165TA5VT	DIODE, SWITCHING

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
D510	MA4082MTA	DIODE
D511	D1NL40V70	DIODE
D512	**D1NL40V70**	**DIODE**
D551	ERD07-15E	DIODE
D552	RU3NLFA1	DIODE
D553	**MA4062LTVTA**	**DIODE, ZENER**
D555	MA165TA5VT	DIODE, SWITCHING
D556	MA165TA5VT	DIODE, SWITCHING
D561	MA165TA5VT	DIODE, SWITCHING
D562	MA165TA5VT	DIODE, SWITCHING
D563	MA4062MTA	DIODE, ZENER
D753	AU01ZV0	DIODE
D801	**RM10BLFA1**	**DIODE**
D802	**RM10BLFA1**	**DIODE**
D803	**RM10BLFA1**	**DIODE**
D804	**RM10BLFA1**	**DIODE**
D805	MA700ATA	DIODE
D806	AU01ZV0	DIODE
D808	**D4DDF1R50001**	**DIODE**
D814	MA178TA5	DIODE
D815	MA165TA5VT	DIODE, SWITCHING
D816	MA165TA5VT	DIODE, SWITCHING
D818	MA4200MTA	DIODE
D820	ERA15-01V3	DIODE, RECTIFIER
D821	ERA15-01V3	DIODE, RECTIFIER
D822	ERA15-01V3	DIODE, RECTIFIER
D823	ERA15-01V3	DIODE, RECTIFIER
D824	**TMPG10G3**	**DIODE**
D825	**RU30ALFS1**	**DIODE, RECTIFIER**
D826	AU02ZV0	DIODE
D827	RU3YX-MV1	DIODE, RECTIFIER
D828	S2L20UP1518	DIODE
D829	S2L20UP1518	DIODE
D830	RU3YX-MV1	DIODE, RECTIFIER
D832	MA165TA5VT	DIODE, SWITCHING
D834	AU02ZV0	DIODE
D835	MA165TA5VT	DIODE, SWITCHING
D836	MA4180MTA	DIODE
D837	MA165TA5VT	DIODE, SWITCHING
D841	MA165TA5VT	DIODE, SWITCHING
D861	TVSA81004V3	DIODE
D862	TVSA81004V3	DIODE
D876	MA165TA5VT	DIODE, SWITCHING
D877	MA165TA5VT	DIODE, SWITCHING
D881	MA165TA5VT	DIODE, SWITCHING
D1001	LN81RPHCF3	DIODE
D1551	ERA22-06V3	DIODE
D1552	MA165TA5VT	DIODE, SWITCHING
D1553	RP1HLFA5	DIODE
D1557	MA165TA5VT	DIODE, SWITCHING
D1558	MA165TA5VT	DIODE, SWITCHING
D2301	MA4360HTA	DIODE, ZENER
D2302	MA165TA5VT	DIODE, SWITCHING
D2303	MA165TA5VT	DIODE, SWITCHING
D2305	MA4110MTA	DIODE, ZENER
D2306	MA4110MTA	DIODE, ZENER
D2307	MA4110MTA	DIODE, ZENER
D2308	MA4110MTA	DIODE, ZENER
D2309	MA4110MTA	DIODE, ZENER
D2310	MA4110MTA	DIODE, ZENER
D2311	MA4110MTA	DIODE, ZENER
D2312	MA4110MTA	DIODE, ZENER
D3001	MA4110MTA	DIODE, ZENER
D3002	MA4110MTA	DIODE, ZENER
D3003	MA4110MTA	DIODE, ZENER
D3004	MA4110MTA	DIODE, ZENER
D3005	MA4110MTA	DIODE, ZENER
D3006	MA4110MTA	DIODE, ZENER
D3007	MA4110MTA	DIODE, ZENER
D3008	MA4110MTA	DIODE, ZENER
D3009	MA4110MTA	DIODE, ZENER
D3010	MA4110MTA	DIODE, ZENER
D3011	MA4110MTA	DIODE, ZENER
D3012	MA4110MTA	DIODE, ZENER
D3051	MA4110MTA	DIODE, ZENER
D3151	MA4140MTA	DIODE
D3152	MA4140MTA	DIODE
D3153	MA4140MTA	DIODE
D3154	MA4140MTA	DIODE
D3155	MA4140MTA	DIODE
D3156	MA4140MTA	DIODE
D3157	MA4062MTA	DIODE, ZENER
D3158	MA4075MTA	DIODE
D3801	MA165TA5VT	DIODE, SWITCHING
D3802	MA165TA5VT	DIODE, SWITCHING
D3803	MA165TA5VT	DIODE, SWITCHING
D3804	MA165TA5VT	DIODE, SWITCHING
D3812	MA4150MTA	DIODE
D3814	ERA22-04V1	DIODE, RECEIVER
D3815	ERA22-04V1	DIODE, RECEIVER
D3816	ERA22-04V1	DIODE, RECEIVER
D4301	MA3036HTX	DIODE
FUSES		
F801	**XBA2A00101**	**FUSE 6.3A 125V**
INTEGRATED CIRCUITS		
IC001	**MN101C46FTF1**	**MPU**
IC002	TVR2AJ099	IEEPROM
IC005	PQ1R33	STANDBY
IC006	PST9128NR	RST
IC101	**TA1310BN**	**V/C/J**

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
IC451	LA78045	V-OUT
IC511	AN6914S-E1	FORCUS SHORT PROTECTER
IC750	NJM4565L	PCC
IC801	**AN8029**	**MAIN POWER**
IC802	**SE139NLF4**	**ERROR AMP**
IC811	**PC123FY2**	**OPTOCOUPLER**
IC881	AN7805LB	MAIN 5V
IC882	AN7809LB	MAIN 9V
IC883	PQ12RD1B	MAIN 12V
IC1551	AN5422K	FREE RUN ADJ.
IC1801	M65617SP	PIP
IC2201	AN5849S-E1V	MTS
IC2301	AN5277	AUDIO OUT
IC2331	NJM4565L	VAO
IC2451	BH3868CFS-E2	SURROUND
IC3001	M52790SP	A/V SWITCH
IC3801	TDA6103Q-N3	RGB DRIVER
IC4301	MM1502XNRE	TNR2 SW
IC5001	PUB4301	RASTER ROTATION
IC5002	AN6564	OP-AMP
IC6501	TC90A49P	COMB FILTER
RM001	PNA4601M04TV	IR-REMOTE SENSOR
	COILS	
J43	EXCELDR35V	FERRITE BEAD *CT-32SX31E/CE/UE*, CT-36SX31E
J217	EXCELSA26T	FERRITE BEAD
LC001	EXCEMT471BTS	EMI FILTER
LC002	EXCEMT471BTS	EMI FILTER
L001	EXCELSA35T	FERRITE BEAD
L002	ELESN180JA	COIL, PEAKING 18UH
L005	ELESN330JA	COIL, PEAKING 33UH
L006	EXCELSA24T	FERRITE BEAD
L007	EXCELSA26T	FERRITE BEAD
L008	EXCELSA39V	FERRITE BEAD
L009	EXCELSA26T	FERRITE BEAD
L012	TLTABT2R2K	COIL, PEAKING 2.2UH
L013	TLTABT2R2K	COIL, PEAKING 2.2UH
L015	TLTABT2R2K	COIL, PEAKING 2.2UH
L016	TLTABT2R2K	COIL, PEAKING 2.2UH
L017	ELESN330JA	COIL, PEAKING 33UH
L019	EXCELSA26T	FERRITE BEAD *CT-36SX31CE/UE*
L020	EXCELSA26T	FERRITE BEAD *CT-36SX31CE/UE*
L106	EXCELSA39V	FERRITE BEAD
L301	TLTABT470K	COIL, PEAKING 47UH
L302	ELESN120JA	COIL, PEAKING 12UH
L319	TLTABT101K	COIL, PEAKING
L519	ELESN101JA	COIL, PEAKING 100UH
L551	**TYPL05511HN**	**COIL** *CT-32SX31E/CE/UE*
L551	**ELH5L7714**	**COIL** *CT-36SX31E/CE/UE*
L553	**ELHKLB077B**	**COIL**
L555	EXCELSA35T	FERRITE BEAD

REF NO.	PART NO.	DESCRIPTION
L556	ELC18B801E	COIL
L559	TLUADNB682K	COIL
L601	TLTABT560K	COIL
L706	EXCELSA26T	FERRITE BEAD
L751	ELC18B801E	COIL
L752	TALFP15B103K	LINE FILTER
L801	**ELF24V037A**	**LINE FILTER**
L802	**ELF24V037A**	**LINE FILTER**
L807	TSKA064-1	FERRITE BEAD
L812	EXCELSA26B	FERRITE BEAD
L814	TALL08T101KA	LINE FILTER
L815	EXCELSA39E	FERRITE BEAD
L816	EXCELSA39E	FERRITE BEAD
L817	EXCELDR35V	FERRITE BEAD
L818	EXCELDR35V	FERRITE BEAD
L819	EXCELSA24T	FERRITE BEAD
L820	EXCELSA24T	FERRITE BEAD
L821	EXCELDR35V	FERRITE BEAD
L824	EXCELDR35V	FERRITE BEAD
L825	TLUADTB121K	COIL
L826	TLUADTB820K	COIL
L827	TALL08T470KA	LINE FILTER
L850	ELESN101JA	COIL, PEAKING 100UH
L851	TLUADTB121K	COIL
L951	EXCELSA24T	FERRITE BEAD
L953	EXCELSA24T	FERRITE BEAD
L954	EXCELSA24T	FERRITE BEAD
L955	EXCELSA24T	FERRITE BEAD
L1551	TALL13T682JB	LINE FILTER
L1801	ELESN1R5KA	COIL, PEAKING 1.5UH
L1803	ELESN2R2KA	COIL, PEAKING 2.2UH
L1804	ELESN150JA	COIL, PEAKING 15UH
L1807	ELESN1R0JA	COIL, PEAKING 1.0UH
L1808	EXCELDR25V	FERRITE BEAD
L3001	EXCELSA35T	FERRITE BEAD
L3805	EXCELSA24T	FERRITE BEAD
L4301	ELESN3R9KA	COIL, PEAKING 3.9UH
L5001	EXCELSA35T	FERRITE BEAD
L5002	EXCELDR35V	FERRITE BEAD
L6502	ELESN150JA	COIL, PEAKING 15UH
L6503	ELESN330JA	COIL, PEAKING 33UH
L6504	ELESN100JA	COIL, PEAKING 10UH
L6507	ELESN150JA	COIL, PEAKING 15UH
	TRANSISTORS	
Q002	2SC1685QRSTA	TRANSISTOR
Q009	2SD601ARTX	TRANSISTOR
Q014	2SD601ARTX	TRANSISTOR
Q201	2SD601ARTX	TRANSISTOR
Q302	2SB709ARTX	TRANSISTOR
Q303	2SD601ARTX	TRANSISTOR

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

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REF NO.	PART NO.	DESCRIPTION
Q402	2SD601ARTX	TRANSISTOR
Q480	2SA1309ATA	TRANSISTOR
Q501	2SC3941RTA	TRANSISTOR
Q515	2SD601ARTX	TRANSISTOR
Q551	2SC5517000LK	TRANSISTOR
Q552	2SC1685QRSTA	TRANSISTOR
Q553	2SC1685QRSTA	TRANSISTOR
Q563	2SC3941RTA	TRANSISTOR
Q603	2SD601ARTX	TRANSISTOR
Q611	2SB709ARTX	TRANSISTOR
Q701	2SD601ARTX	TRANSISTOR
Q702	2SA1309ATA	TRANSISTOR
Q751	2SK2146LB	TRANSISTOR
Q754	2SC1685QRSTA	TRANSISTOR
Q801	2SK2917LB	TRANSISTOR
Q802	2SC1685QRSTA	TRANSISTOR
Q803	2SC1685QRSTA	TRANSISTOR
Q804	2SA564AQRSTA	TRANSISTOR
Q854	2SA19610QAHW	TRANSISTOR
Q881	2SC1685QRSTA	TRANSISTOR
Q882	2SB709ARTX	TRANSISTOR
Q883	2SB709ARTX	TRANSISTOR
Q901	2SD601ARTX	TRANSISTOR
Q951	2SC1685QRSTA	TRANSISTOR
Q952	2SC1685QRSTA	TRANSISTOR
Q953	2SC1741ASTP	TRANSISTOR
Q954	2SB1030ATA	TRANSISTOR
Q955	2SB1569AF51E	TRANSISTOR
Q956	2SD2400AF51E	TRANSISTOR
Q957	2SA564AQRSTA	TRANSISTOR
Q958	2SC1685QRSTA	TRANSISTOR
Q961	2SC1685QRSTA	TRANSISTOR
Q962	2SC1685QRSTA	TRANSISTOR
Q1051	2SC1685QRSTA	TRANSISTOR
Q1551	2SC3425RLMAT	TRANSISTOR
Q1552	2SC1685QRSTA	TRANSISTOR
Q1553	2SC1685QRSTA	TRANSISTOR
Q1554	2SC1685QRSTA	TRANSISTOR
Q1555	2SC5460LB	TRANSISTOR
Q1801	2SD601ARTX	TRANSISTOR
Q1802	2SD601ARTX	TRANSISTOR
Q1803	2SD601ARTX	TRANSISTOR
Q1804	2SB709ARTX	TRANSISTOR
Q1805	2SB709ARTX	TRANSISTOR
Q2302	2SD601ARTX	TRANSISTOR
Q2331	2SD601ARTX	TRANSISTOR
Q2332	2SB709ARTX	TRANSISTOR
Q2333	2SD601ARTX	TRANSISTOR
Q2334	2SD601ARTX	TRANSISTOR
Q2335	2SB709ARTX	TRANSISTOR
Q2336	2SD601ARTX	TRANSISTOR
Q3050	2SD601ARTX	TRANSISTOR
Q3802	2SA564AQRSTA	TRANSISTOR
Q4309	2SB709ARTX	TRANSISTOR
Q4310	2SD601ARTX	TRANSISTOR
Q4311	2SB709ARTX	TRANSISTOR
Q4312	2SD601ARTX	TRANSISTOR
Q4313	2SD601ARTX	TRANSISTOR
Q4315	2SC3940AQRTA	TRANSISTOR
Q6501	2SD601ARTX	TRANSISTOR
Q6502	2SB709ARTX	TRANSISTOR
Q6510	2SB709ARTX	TRANSISTOR
Q6511	2SD601ARTX	TRANSISTOR
Q6512	2SD601ARTX	TRANSISTOR
Q6519	2SD601ARTX	TRANSISTOR
RELAYS		
RL801	**TSEH8007**	**RELAY**
RL802	**TSE10814**	**RELAY**
RESISTORS		
R002	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W
R003	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R004	ERDS1TJ122T	RES,C 1.2K-J-1/2W
R005	ERDS2TJ101T	RES,C 100-J-1/4W
R006	ERJ6ENF1372V	RES,M 13.7K-F-1/10W
R007	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R008	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R009	ERJ6GEYJ221V	RES,M 220-J-1/10W
R010	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R011	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R013	ERJ6ENF1002V	RES,M 10K-F-1/10W
R014	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R015	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R016	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R017	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R020	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R021	ERJ6GEYJ101V	RES,M 100-J-1/10W
R022	ERJ6GEYJ101V	RES,M 100-J-1/10W
R023	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R024	ERJ6ENF2322V	RES,M 23.2K-F-1/10W
R025	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R026	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R027	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R028	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R029	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R030	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R033	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R034	ERJ6GEYJ563V	RES,M 56K-J-1/10W
R040	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R041	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R042	ERJ6GEYJ102V	RES,M 1K-J-1/10W

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R043	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R044	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R046	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R048	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R049	ERJ6GEYJ101V	RES,M 100-J-1/10W
R051	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R058	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R060	ERJ6GEYJ471V	RES,M 470-J-1/10W
R061	ERJ6GEYJ471V	RES,M 470-J-1/10W
R066	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R067	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R068	ERJ6GEYJ752V	RES,M 7.5K-J-1/10W
R072	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R073	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R074	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R075	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R076	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R077	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R078	ERJ6GEYJ101V	RES,M 100-J-1/10W
R079	ERJ6GEYJ101V	RES,M 100-J-1/10W
R081	ERJ6GEYJ220V	RES,M 22-J-1/10W
R082	ERJ6GEYJ562V	RES,M 5.6K-J-1/10W
R086	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R087	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R088	ERDS2TJ103T	RES,C 10K-J-1/4W
R122	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R201	ERJ6GEYJ331V	RES,M 330-J-1/10W
R223	ERJ6GEYJ561V	RES,M 560-J-1/10W
R225	ERDS2TJ331T	RES,C 330-J-1/4W
R226	ERDS2TJ331T	RES,C 330-J-1/4W
R245	ERJ6GEYJ224V	RES,M 220K-J-1/10W
R246	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R301	ERJ6GEYJ101V	RES,M 100-J-1/10W
R302	ERJ6GEYJ101V	RES,M 100-J-1/10W
R303	ERJ6GEYJ101V	RES,M 100-J-1/10W
R305	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R306	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R309	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R310	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R328	ERDS2TJ105T	RES,C 1M-J-1/4W
R329	ERJ6GEYJ304V	RES,M 300K-J-1/10W
R341	ERJ6GEYJ474V	RES,M 470K-J-1/10W
R401	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R402	ERJ6GEYJ471V	RES,M 470-J-1/10W
R403	ERJ6GEYJ622V	RES,M 6.2K-J-1/10W
R404	ERJ6GEYJ101V	RES,M 100-J-1/10W
R405	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R409	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R410	ERJ6ENF2492V	RES,M 24.9K-F-1/10W
R412	ERJ6ENF1103V	RES,M 110K-F-1/10W

REF NO.	PART NO.	DESCRIPTION
R451	ERG2FJ221H	RES,M 220-J-2W
R452	ERDS1FJ6R8T	RES,C 6.8-J-1/2W
R453	ER0S2TKF1202	RES,M 12K-F-1/4W
R454	ERDS2TJ182T	RES,C 1.8K-J-1/4W
R455	ERDS2TJ512T	RES,C 5.1K-J-1/4W
R456	ERDS2TJ182T	RES,C 1.8K-J-1/4W
R457	ERDS2TJ112T	RES,C 1.1K-J-1/4W
R459	ERX1SJ1R2P	RES,M 1.2-J-1W
R460	ER0S2TKF1002	RES,M 10K-F-1/4
R461	ER0S2TKF1601	RES,M 1.6K-F-1/4
R465	ERJ6GEYJ104V	RES,M 100K-J-1/10W
R468	ERJ6GEYJ104V	RES,M 100K-J-1/10W
R472	ERJ6GEYJ123V	RES,M 12K-J-1/10W
R476	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R480	ERDS2TJ392T	RES,C 3.9K-J-1/4W
R481	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R482	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R485	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W
R486	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R487	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R489	ER0S2TKF1202	RES,M 12K-F-1/4W
R490	ER0S2TKF5101	RES,M 5.1K-F-1/4W
R491	ER0S2TKF1052	RES,M 10.5K-F-1/4W
R501	ERDS2TJ561T	RES,C 560-J-1/4W
R502	ERDS2TJ561T	RES,C 560-J-1/4W
R503	ERG3FJ332H	RES,M 2.3K-J-3W
R504	ERJ6GEYJ333V	RES,M 33K-J-1/10W
R505	ERDS1TJ561T	RES,C 560-J-1/2W
R510	ERG2FJ122H	RES,M 12K-J-2W
R512	ERG3FJ222H	RES,M 2200-J-3W
R513	ERG3FJ222H	RES,M 2200-J-3W
R514	ER0S2TKF3302	RES,M 33K-F-1/4W
R515	ER0S2TKF3742	RES,M 37.4K-F-1/4W
R516	ERDS2TJ101T	RES,C 100-J-1/4W
R517	ERG1SJ103P	RES,M 10K-J-1W
R518	**ERDS1FJ1R5T**	**RES,C 1.5-J-1/2W**
R519	**ERQ1CKPR22S**	**RES,F .22-K-1W**
R520	**ERQ14AJ2R2E**	**RES,F 2.2-J-1/4W**
R521	**ER0S2TKF8201**	**RES,M 8.2K-F-1/4W**
R522	**ER0S2TKF3001**	**RES,M 3K-F-1/4W**
R527	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R528	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R529	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R542	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W
R555	ERDS2TJ472T	RES,C 4.7K-J-1/4
R556	ERDS2TJ103T	RES,C 10K-J-1/4W
R557	ERDS2TJ103T	RES,C 10K-J-1/4W
R558	ERDS2TJ472T	RES,C 4.7K-J-1/4
R559	ERDS2TJ102T	RES,C 1K-J-1/4W
R561	ERDS2TJ222T	RES,C 2.2K-J-1/4W

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R562	ERDS2TJ473T	RES,C 47K-J-1/4W
R576	ERQ12AJ101P	RES,F 100-J-1/2W
R590	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R591	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R592	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R596	ERDS2TJ102T	RES,C 1K-J-1/4W
R601	ERJ6GEYJ391V	RES,M 390-J-1/10W
R606	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R613	ERJ6GEYJ471V	RES,M 470-J-1/10W
R614	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R618	ERJ6GEYJ474V	RES,M 470K-J-1/10W
R619	ERJ6GEYJ563V	RES,M 56K-J-1/10W
R620	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R701	ERJ6GEYJ122V	RES,M 1.2K-J-1/10W
R702	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R704	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R705	ERDS2TJ472T	RES,C 4.7K-J-1/4
R706	ERDS2TJ394T	RES,C 390K-J-1/4W
R707	ERDS2TJ393T	RES,C 39K-J-1/4W
R708	ERDS2TJ101T	RES,C 100-J-1/4W
R709	ERDS2TJ103T	RES,C 10K-J-1/4W
R710	ERDS2TJ103T	RES,C 10K-J-1/4W
R711	ERDS2TJ183T	RES,C 18K-J-1/4W
R712	ERDS2TJ472T	RES,C 4.7K-J-1/4
R713	ERDS2TJ822T	RES,C 8.2K-J-1/4W
R714	ERDS1FJ102T	RES,C 1K-J-1/2W
R716	ERDS2TJ101T	RES,C 100-J-1/4W
R717	ERDS2TJ101T	RES,C 100-J-1/4W
R719	ERDS2TJ331T	RES,C 330-J-1/4W
R720	ERDS2TJ103T	RES,C 10K-J-1/4W
R752	ERDS2TJ103T	RES,C 10K-J-1/4W
R753	ERDS1FJ102T	RES,C 1K-J-1/2W
R754	ERDS1TJ751T	RES,C 750-J-1/2W
R756	ERG2FJ820H	RES,M 82-J-2W
R801	**ERF7ZK1R0**	**RES,W 1.0-K-7W**
R802	ERC14GK824D	RES,C 820K-K-1/4W
R807	ERDS2TJ820T	RES,C 82-J-1/4W
R808	ERDS2TJ680T	RES,C 68-J-1/4W
R809	ERDS2TJ472T	RES,C 4.7K-J-1/4
R810	ERDS2TJ473T	RES,C 47K-J-1/4W
R811	ERDS2TJ472T	RES,C 4.7K-J-1/4
R812	ERDS2TJ473T	RES,C 47K-J-1/4W
R813	ERDS1FJ122T	RES,C 1.2K-J-1/2
R814	ERG3FJ103H	RES,M 10K-J-3W
R815	ERDS2TJ331T	RES,C 330-J-1/4W
R816	ERDS2TJ471T	RES,C 470-J-1/4W
R817	ER0S2TKF1371	RES,M 1370-F-1/4W
R818	ERDS2TJ220T	RES,C 22-J-1/4W
R819	ERDS1FJ390T	RES,C 39-J-1/2W
R820	ERDS1FJ120T	RES, C 12-J-1/2W
R821	ERX12SJ1R0P	RES,M 1.0-J-1/2W
R822	ERX12SJ1R0P	RES,M 1.0-J-1/2W
R823	ERDS2TJ102T	RES,C 1K-J-1/4W
R824	ERDS2TJ153T	RES,C 15K-J-1/4W
R825	ERDS2TJ104T	RES,C 100K-J-1/4W
R826	ERDS2TJ103T	RES,C 10K-J-1/4W
R828	ERDS2TJ103T	RES,C 10K-J-1/4W
R829	ERDS2TJ103T	RES,C 10K-J-1/4W
R830	ERDS2TJ103T	RES,C 10K-J-1/4W
R832	**ERD75TAJ825**	**RES,C 8.2MEG-J-3/4W**
R835	ERDS2TJ101T	RES,C 100-J-1/4W
R836	ERG1SJ273P	RES,M 27K-J-1W
R837	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R839	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R840	ERDS2TJ470T	RES,C 47-J-1/4W
R846	ERDS2TJ272T	RES,C 2.7K-J-1/4W
R847	ERDS2TJ223T	RES,C 22K-J-1/4W
R850	ERX3FJ2R7	RES,M 2.7-J-3W
R852	ERDS1FJ391T	RES,C 390-J-1/2W
R855	ERDS2TJ913T	RES,C 91K-J-1/4W
R856	ERDS2TJ123T	RES,C 12K-J-1/4W
R857	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R858	ERDS1FJ1R0T	RES,C 1.0-J-1/2W
R859	ERDS2TJ103T	RES,C 10K-J-1/4W
R860	ERDS1FJ102T	RES,C 1K-J-1/2W
R861	**ERX12SJR22P**	**RES,M .22-J-1/2W**
R862	**ERX12SJR22P**	**RES,M .22-J-1/2W**
R863	**ERX12SJR22P**	**RES,M .22-J-1/2W**
R881	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R882	ERJ6GEYJ271V	RES,M 270-J-1/10W
R883	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R884	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R885	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R886	ERDS2TJ181T	RES,C 180-J-1/4W
R901	ERJ6GEYJ331V	RES,M 330-J-1/10W
R902	ERJ6GEYJ391V	RES,M 390-J-1/10W
R903	ERJ6GEYJ471V	RES,M 470-J-1/10W
R922	ERJ6GEYJ331V	RES,M 330-J-1/10W
R951	ERDS2TJ821T	RES,C 820-J-1/4W
R952	ERDS2TJ223T	RES,C 22K-J-1/4W
R953	ERDS2TJ332T	RES,C 3.3K-J-1/4W
R954	ERDS2TJ431T	RES,C 430-J-1/4W
R956	ERDS2TJ510T	RES,C 51-J-1/4W
R958	ERDS2TJ391T	RES,C 390-J-1/4W
R959	ERDS2TJ101T	RES,C 100-J-1/4W
R960	ERQ14AJ100P	RES,F 10-J-1/4W
R961	ERQ1CJP331S	RES,F 330-J-1W
R962	ERDS2TJ330T	RES,C 33-J-1/4W
R963	ERDS2TJ330T	RES,C 33-J-1/4W
R964	ERDS2TJ471T	RES,C 470-J-1/4W

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R965	ERDS2TJ563T	RES,C 56K-J-1/4W
R966	ERDS1FJ471P	RES,C 470-J-1/2W
R967	ERDS2TJ563T	RES,C 56K-J-1/4W
R968	ERDS2TJ471T	RES,C 470-J-1/4W
R969	ERDS2TJ390T	RES,C 39-J-1/2W
R970	ERDS2TJ2R7T	RES,C 2.7-J-1/4W
R971	ERDS2TJ2R7T	RES,C 2.7-J-1/4W
R972	ERDS2TJ390T	RES,C 39-J-1/2W
R973	ERDS2TJ101T	RES,C 100-J-1/4W
R974	ERDS2TJ333T	RES,C 33K-J-1/4W
R975	ERDS2TJ101T	RES,C 100-J-1/4W
R976	ERDS2TJ101T	RES,C 100-J-1/4W
R977	ERDS2TJ561T	RES,C 560-J-1/4W
R978	ERDS2TJ101T	RES,C 100-J-1/4W
R987	ERDS2TJ472T	RES,C 4.7K-J-1/4
R988	ERDS2TJ331T	RES,C 330-J-1/4W
R989	ERDS2TJ682T	RES,C 6.8K-J-1/4W
R990	ERDS2TJ471T	RES,C 470-J-1/4W
R993	ERDS2TJ471T	RES,C 470-J-1/4W
R1051	ER0S2TKF1002	RES,M 10K-F-1/4
R1052	ER0S2TKF2611	RES,M 2.6K-F-1/4W
R1053	ER0S2TKF2321	RES,M 2.32K-F-1/4W
R1054	ER0S2TKF3481	RES,M 3.48K-F-1/4W
R1055	ER0S2TKF5231	RES,M 5.2K-F-1/4W
R1056	ER0S2TKF9761	RES,M 9.76-F-1/4W
R1057	ER0S2TKF2372	RES,M 23.7K-F-1/4W
R1058	ERDS2TJ103T	RES,C 10K-J-1/4W
R1059	ERDS2TJ102T	RES,C 1K-J-1/4W
R1062	ERDS2TJ182T	RES,C 1.8K-J-1/4W
R1063	ERDS2TJ470T	RES,C 47-J-1/4W
R1064	ERDS2TJ103T	RES,C 10K-J-1/4W
R1065	ERDS2TJ104T	RES,C 100K-J-1/4W
R1066	ERDS2TJ473T	RES,C 47K-J-1/4W
R1510	ERC12GK101D	RES,C 100-K-1/2W
R1511	ERDS2TJ913T	RES,C 91K-J-1/4W
R1512	ERDS2TJ913T	RES,C 91K-J-1/4W
R1513	ERDS2TJ753T	RES,C 75K-J-1/4W
R1550	ERDS2TJ221T	RES,C 220-J-1/4W
R1554	ERDS2TJ103T	RES,C 10K-J-1/4W
R1555	ERDS2TJ822T	RES,C 8.2K-J-1/4W
R1556	ER0S2TKF1802	RES,M 18K-F-1/4W
R1558	ERDS2TJ473T	RES,C 47K-J-1/4W
R1559	ERDS2TJ561T	RES,C 560-J-1/4W
R1560	ERDS2TJ472T	RES,C 4.7K-J-1/4
R1561	ERDS2TJ564T	RES,C 560K-J-1/4W
R1562	ERDS2TJ472T	RES,C 4.7K-J-1/4
R1563	ER0S2TKF9102	RES,M 91K-F-1/4W
R1564	ER0S2TKF6041	RES,M 6.04-F-1/4W
R1565	ERDS2TJ104T	RES,C 100K-J-1/4W
R1566	ERDS2TJ104T	RES,C 100K-J-1/4W

REF NO.	PART NO.	DESCRIPTION
R1567	ERDS2TJ104T	RES,C 100K-J-1/4W
R1568	ERDS2TJ104T	RES,C 100K-J-1/4W
R1570	ERC12GK104D	RES,C 100K-K-1/2W
R1571	ERQ2RJW821E	RES,F 820-J-2W
R1572	ERDS2TJ334T	RES,C 330K-J-1/4W
R1573	ERDS2TJ473T	RES,C 47K-J-1/4W
R1575	ERDS2TJ683T	RES,C 68K-J-1/4W
R1576	ERDS2TJ101T	RES,C 100-J-1/4W
R1577	EVMEGSA00B54	RESISTOR, VARIABLE
R1578	ERDS2TJ822T	RES,C 8.2K-J-1/4W
R1579	ERDS2TJ123T	RES,C 12K-J-1/4W
R1580	ERDS2TJ563T	RES,C 56K-J-1/4W
R1581	EVMEGSA00B53	RESISTOR, VARIABLE
R1582	ERDS2TJ752T	RES,C 7.5K-J-1/4W
R1583	ERDS2TJ223T	RES,C 22K-J-1/4W
R1584	ERDS2TJ222T	RES,C 2.2K-J-1/4W
R1585	ERDS2TJ102T	RES,C 1K-J-1/4W
R1586	ERDS1TJ681T	RES,C 680-J-1/2W
R1587	ERDS2TJ101T	RES,C 100-J-1/4W
R1588	ERG2FJ472H	RES,M 4.7K-J-2W
R1589	ERG3FJ821H	RES,M 820-J-3W
R1590	ERDS2TJ223T	RES,C 22K-J-1/4W
R1591	ERG3FJ821H	RES,M 820-J-3W
R1592	ERDS2TJ684T	RES,C 680K-J-1/4W
R1593	ERDS2TJ125T	RES,C 1.2M-J-1/4W
R1594	ERDS2TJ125T	RES,C 1.2M-J-1/4W
R1595	ERDS2TJ102T	RES,C 1K-J-1/4W
R1801	ERJ6GEYJ301V	RES,M 300-J-1/10W
R1802	ERJ6GEYJ104V	RES,M 100K-J-1/10W
R1803	ERJ6GEYJ474V	RES,M 470K-J-1/10W
R1804	ERJ6GEYJ202V	RES,M 2K-J-1/10W
R1805	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1807	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R1808	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R1809	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R1810	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R1811	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R1812	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R1813	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R1814	ERJ6GEYJ271V	RES,M 270-J-1/10W
R1815	ERJ6GEYJ361V	RES,M 360-J-1/10W
R1822	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R1823	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R1825	ERJ6GEYJ471V	RES,M 470-J-1/10W
R1827	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1828	ERJ6GEYJ471V	RES,M 470-J-1/10W
R1830	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R1856	ERJ6GEYJ153V	RES,M 15K-J-1/10W
R2203	ERJ6GEYJ751V	RES,M 750-J-1/10W
R2206	ERJ6GEYJ102V	RES,M 1K-J-1/10W

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R2207	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2220	ERJ6GEYJ101V	RES,M 100-J-1/10W
R2221	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R2303	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2304	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2307	ERJ6GEYJ822V	RES,M 8.2K-J-1/10W
R2309	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2310	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2311	ERJ6GEYJ271V	RES,M 270-J-1/10W
R2316	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2317	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2318	ERDS1TJ332T	RES,C 3.3K-J-1/2W
R2319	ERDS1TJ332T	RES,C 3.3K-J-1/2W
R2323	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R2324	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2325	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2326	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2331	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2332	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2333	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2334	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2335	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R2336	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R2337	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R2338	ERJ6GEYJ332V	RES,M 3.3K-J-1/10W
R2339	ERJ6GEYJ183V	RES,M 18K-J-1/10W
R2340	ERJ6GEYJ392V	RES,M 3.9K-J-1/10W
R2345	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2346	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2347	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2348	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R2349	ERJ6GEYJ472V	RES,M 4.7K-J-1/10W
R2356	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R2366	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R2367	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R2385	ERG1SJ151P	RES,M 150-J-1W
R2386	ERG1SJ151P	RES,M 150-J-1W
R2431	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2432	ERJ6GEYJ105V	RES,M 1M-J-1/10W
R2433	ERJ6ENF4701V	RES,M 4.7K-F-1/10W
R2434	ERJ6GEYJ681V	RES,M 680-J-1/10W
R2435	ERJ6ENF3902V	RES,M 39K-F-1/10W
R2436	ERJ6ENF6202V	RES,M 62K-F-1/10W
R2437	ERJ6GEYJ681V	RES,M 680-J-1/10W
R2438	ERJ6GEYJ271V	RES,M 270-J-1/10W
R2439	ERJ6GEYJ271V	RES,M 270-J-1/10W
R3001	ERJ6GEYJ101V	RES,M 100-J-1/10W
R3003	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3004	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3005	ERJ6ENF75R0V	RES,M 75.0-F-1/10W
R3013	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3014	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3015	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3016	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3017	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3018	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3019	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3020	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3021	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3022	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3023	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3024	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R3025	ERJ6GEYJ330V	RES,M 33-J-1/10W
R3060	ERJ6GEYJ471V	RES,M 470-J-1/10W
R3061	ERJ6GEYJ471V	RES,M 470-J-1/10W
R3065	ERJ6GEYJ680V	RES,M 68-J-1/10W
R3069	ERJ6GEYJ471V	RES,M 470-J-1/10W
R3152	ERDS2TJ224T	RES,C 220K-J-1/4W
R3154	ERDS2TJ224T	RES,C 220K-J-1/4W
R3801	ERDS2TJ471T	RES,C 470-J-1/4W
R3802	ERDS2TJ471T	RES,C 470-J-1/4W
R3803	ERDS2TJ471T	RES,C 470-J-1/4W
R3804	ER0S2TKF9100	RES,M 910-F-1/4W
R3805	ER0S2TKF9100	RES,M 910-F-1/4W
R3806	ER0S2TKF9100	RES,M 910-F-1/4W
R3808	ER0S2TKF1001	RES,M 1K-F-1/4W
R3810	ER0S2TKF1001	RES,M 1K-F-1/4W
R3811	ER0S2TKF1001	RES,M 1K-F-1/4W
R3814	ER0S2TKF7681	RES,M 7.68K-F-1/4W
R3815	ERG1SJ104P	RES,M 100K-J-1W
R3816	ERDS2TJ103T	RES,C 10K-J-1/4W
R3817	ERG1SJ104P	RES,M 100K-J-1W
R3818	ERG1SJ104P	RES,M 100K-J-1W
R3819	ER0S2TKF1501	RES,M 1.5K-F-1/4W
R3823	ERQ12AJ121P	RES,F 120-J-1/2W
R3824	ERC12GK222V	RES,C 2200-K-1/2W
R3825	ERC12GK222V	RES,C 2200-K-1/2W
R3826	ERC12GK222V	RES,C 2200-K-1/2W
R4319	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W *CT-36SX31E/CE/UE*
R4319	ERJ6GEYJ272V	RES,M 2.7K-J-1/10W *CT-32SX31E/CE/UE*
R4326	ERDS2TJ272T	RES,C 2.7K-J-1/4W
R4327	ERJ6GEYJ331V	RES,M 330-J-1/10W
R4328	ERJ6GEYJ560V	RES,M 56-J-1/10W
R4329	ERJ6GEYJ182V	RES,M 1.8K-J-1/10W
R4330	ERJ6GEYJ561V	RES,M 560-J-1/10W
R4331	ERJ6GEYJ391V	RES,M 390-J-1/10W
R4332	ERJ6GEYJ393V	RES,M 39K-J-1/10W
R4333	ERJ6GEYJ304V	RES,M 300K-J-1/10W
R4334	ERJ6GEYJ152V	RES,M 1.5K-J-1/10W

REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
R4336	ERJ6GEYJ680V	RES,M 68-J-1/10W
R4338	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R4339	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R4340	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R4341	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
R4342	ERJ6GEYJ223V	RES,M 22K-J-1/10W
R4344	ERJ6GEYJ682V	RES,M 6.8K-J-1/10W
R4345	ERJ6GEYJ103V	RES,M 10K-J-1/10W
R5001	ERDS2TJ472T	RES,C 4.7K-J-1/4
R5003	ERX12SJ2R7P	RES,M 2.7-J-1/2W
R5004	ERDS2TJ272T	RES,C 2.7K-J-1/4W
R5005	ER0S2TKF1331	RES,M 1.33-F-1/4W
R5006	ER0S2TKF3320	RES,M 332-F-1/4W
R5007	ER0S2TKF1001	RES,M 1K-F-1/4W
R5008	ER0S2TKF3832	RES,M 38.3K-F-1/4W
R5009	ER0S2TKF9091	RES,M 9.09K-F-1/4W
R5010	ER0S2TKF2213	RES,M .221-F-1/4
R5011	ER0S2TKF5491	RES,M 5.49K-F-1/4W
R5012	ER0S2TKF2701	RES,M 2.7K-F-1/4W
R5014	ERDS1FJ180T	RES,C 18-J-1/2W
R6501	ERJ6GEYJ273V	RES,M 27K-J-1/10W
R6502	ERJ6GEYJ473V	RES,M 47K-J-1/10W
R6503	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6504	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6505	ERJ6ENF1301V	RES,M 1.3K-F-1/10W
R6506	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6507	ERJ6GEYJ221V	RES,M 220-J-1/10W
R6509	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6510	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6512	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6517	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6520	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6522	ERJ6GEYJ561V	RES,M 560-J-1/10W
R6524	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6538	ERJ6GEYJ821V	RES,M 820-J-1/10W
R6548	ERJ6GEYJ471V	RES,M 470-J-1/10W
R6565	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6566	ERJ6GEYJ102V	RES,M 1K-J-1/10W
R6567	ERJ6GEYJ222V	RES,M 2.2K-J-1/10W
	SWITCHES	
S001	EVQPF106K	SWITCH
S002	EVQPBD05R	SWITCH
S003	EVQPBD05R	SWITCH
S004	EVQPBD05R	SWITCH
S005	EVQPBD05R	SWITCH
S006	EVQPBD05R	SWITCH
S007	EVQPBD05R	SWITCH
	TRANSFORMERS	
T501	ETH19Y70AY	TRANSFORMER, HORIZONTAL DRIVER
T551	**KFT5AA369F**	**TRANSFORMER, FLYBACK**
T801	**ETS44KA165AG**	**TRANSFORMER**

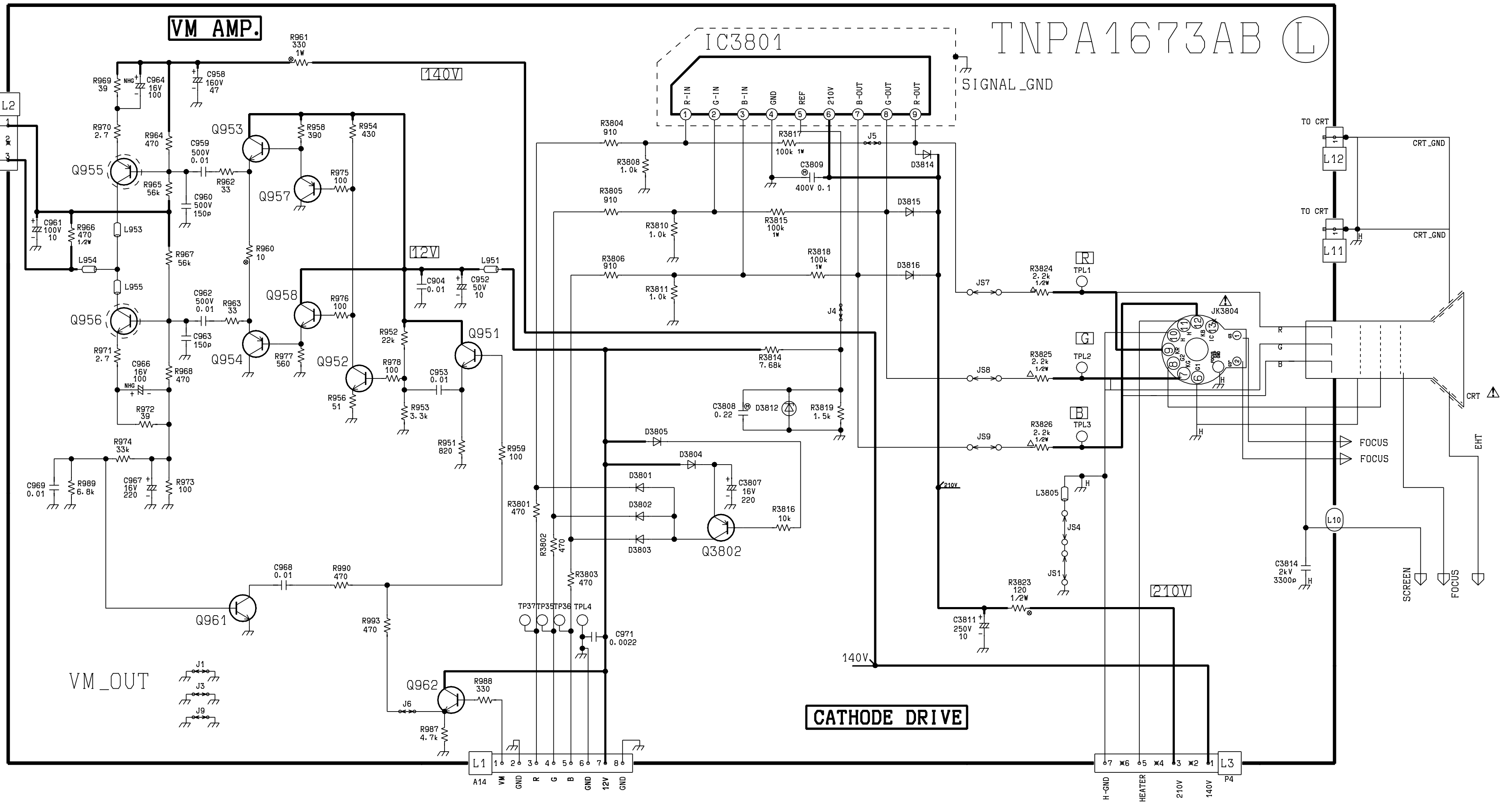
REF NO.	PART NO.	DESCRIPTION
T802	**TLP16297**	**TRANSFORMER, POWER SUPPLY**
T1551	**ETF18L32B**	**TRANSFORMER (FTB)**
	CRISTALS/FILTERS	
X001	TSSA092	CRYSTAL OSCILLATOR
X501	TSS2AA001	CRYSTAL, 3.58MHZ
X601	TAFCSB503F30	CRYSTAL
X1801	TSSA092	CRYSTAL OSCILLATOR
	OTHERS	
TNR001	**ENG36613G**	**TUNER**
TNR002	**ENG36603G**	**TUNER**
M001	EUR511500	XMTR, REMOTE CONTROL
M002	UR51EC975A	BATTERY COVER, REMOTE CON
M003	**A90LSW195X**	**CRT 36** *CT-36SX31E/CE/UE*
M004	**M80LSW195X**	**CRT 32** *CT-32SX31E/CE/UE*
M005	**TJSC01800**	**CRT SOCKET**
M006	0FMK014ZZ	CONVERGENCE CORRECTOR STRIP
DY	**TLY2AA017**	**YOKE, DEFLECTION** *CT-36SX31E/CE/UE*
DY	**TLY2AA018**	**DELECTION YOKE** *CT-32SX31E/CE/UE*
DEG	**TSP2AA015**	**COIL, DEGAUSSING 36** *CT-36SX31E/CE/UE*
DEG	**TSP2AA016-1**	**COIL, DEGAUSSING 32** *CT-32SX31E/CE/UE*
M007	TXFYA010EEW	ASSY, DAG GROUND *CT-32SX31E/CE/UE*
M008	EAGG1218M2	DOME, SPEAKER
M009	ENPE630	SPLITTER, RF
M010	TBM2AA0024	BADGE, PANASONIC
M011	TEK6940	DOOR CATCH
M012	TKP2AA0391	IR PANEL
M013	TQB2AA7060	REMOTE GUIDE
M014	TKP2AA0403S	ASSY, FRONT DOOR
M015	TMW2A97121	STRAIN RELIEF: AC LINE CORD
M016	**TSX2AA0111**	**AC LINE CORD**
M017	TQB2AA0372	MANUAL, OWNERS *CT-32SX31E/UE CT-36SX31E/UE*
M018	TQB2AA0402	MANUAL, OWNERS *CT-32SX31CE CT-36SX31CE*
M019	TSP2AF003	COIL, GEOMAGNETIC *CT-36SX31E/CE/UE*
M020	TSP2AF004	COIL, GEOMAGNETIC *CT-32SX31E/CE/UE*
M021	TXANV07ESER	REPAIR KIT (FRONT PANELS) Right panel(1),Left panel(1) *CT-32SX31E/CE/UE*
M022	TXANV08ESER	REPAIR KIT (FRONT PANELS) Right panel(1),Left panel(1) *CT-36SX31E/CE/UE*
M023	TXFBX01ESER	ASSY, POWER BUTTON Plastic Button & Spring

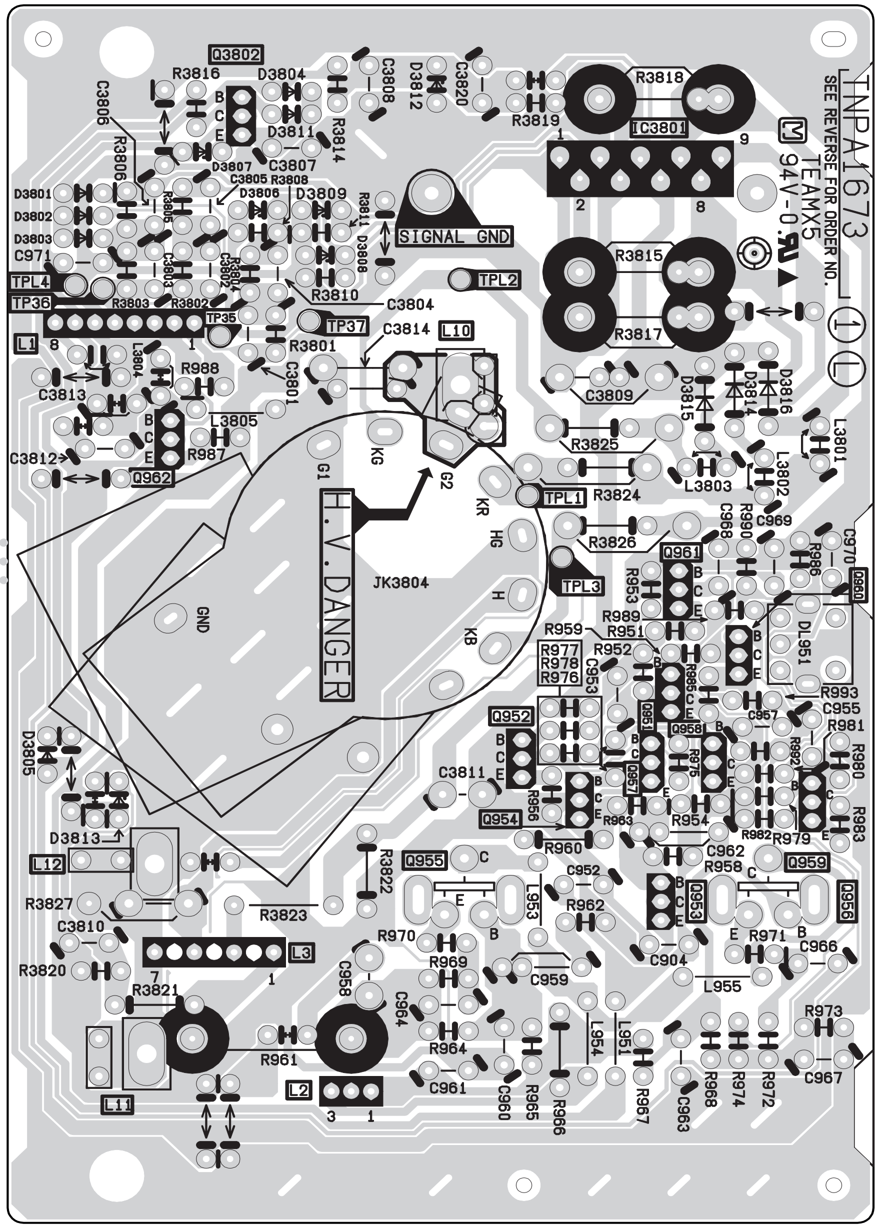
REPLACEMENT PARTS LIST

Model: CT-32SX31E/UE/CE & CT-36SX31E/UE/CE.

Important Safety Notice: Components printed in **BOLD TYPE** have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.

REF NO.	PART NO.	DESCRIPTION
M024	TXFKU19ESER	ASSY, CABINET BACK Rubber sheet(1),Double Insul. Label(1),Cover Cabt.Back(1), Felt(1), Label X-ray Warning Frnt.(1), Label, CRTreplacement(1) *CT-32SX31E/CE/UE*
M025	TXFKU20ESER	ASSY, CABINET BACK Rubber sheet(1), Double Insul.Label(1), Cover Cabt.Back(1), Felt(1), Label X-ray Warning Frnt.(1), Label, CRTreplacement(1) *CT-36SX31E/CE/UE*
M026	TXFKY29ESER	ASSY, CABINET FRONT Rubber Sheet(1), Badge panasonic(1), Overlay(1), Pin gt(1), Ir Panel(1), Cab. Front(1), Felt Roll (8mm x 46m) or (12mm x 46m). *CT-32SX31E/CE/UE*
M027	TXFKY30ESER	ASSY, CABINET FRONT Rubber Sheet(1), Badge panasonic(1), Overlay(1), Pin gt(1), Ir Panel(1),Cab. Front(1), Felt Roll (8mm x 46m) or (12mm x 46m) *CT-36SX31E/CE/UE*
M028	TXFSPB01BSER	ASSY, SPEAKER BRACKET Sponge(2),Sleeve(2), Frame, chassis(1), Instr.Sheet spkr.Brkts.(1). *CT-36SX31E/CE/UE*
M029	TXFSPB02BSER	ASSY, SPEAKER BRACKET Speaker horn(1), Sponge(2), sleeve(2), Instr.Sheet spkr.Brkts.(1). *CT-32SX31E/CE/UE*
JK3001	TJB2AA0361	TERMINAL, REAR A/V
JK3151	TJBA187	JACK, A/V OUTPUT
M030	TQB2AA7078	V-CHIP


VM AMP.
TNPA1673AB L
IC3801
SIGNAL_GND
VM COIL
VM_OUT
CATHODE DRIVE
140V
12V
210V
Q951
Q952
Q953
Q954
Q955
Q956
Q957
Q958
Q961
Q962
Q3802
L1
L2
L3
L10
L11
L12
JK3804
TO CRT
CRT_GND
FOCUS
SCREEN
EHT
CRT
H-GND
HEATER


TNPA1673
SEE REVERSE FOR ORDER NO.
94V-0
IC3801
SIGNAL GND
H.V.DANGER
JK3804
Q3802
Q952
Q954
Q955
Q956
Q959
Q961
Q962
L1
L2
L3
L10
L11
L12
TPL1
TPL2
TPL3
TPL4

L-Board Voltages - Voltajes Placa-L

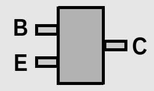
	Q3802	Q951	Q952	Q953
B	0.00	5.40	1.40	6.60
C	0.00	11.90	6.00	11.90
E	0.00	4.80	0.70	4.60

	Q954	Q955	Q956	Q957
B	5.30	137.70	0.90	0.00
C	0.00	70.20	70.20	0.00
E	5.90	138.2	0.40	6.60

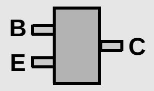
	Q958	Q961	Q962
B	5.90	0.10	6.10
C	11.90	0.10	11.90
E	5.30	0.00	5.40

IC3801	
1	..... 1.90
2	..... 1.90
3	..... 1.90
4	..... 0.00
5	..... 1.90
6	... 217.30
7	... 137.40
8	... 143.40
9	... 140.00

CHIP TRANSISTOR LEAD DESIGNATION



IDENTIFICACIÓN DE TERMINALES PARA TRANSISTORES EN *CHIP*



Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ♀ Test point but no pin ♀.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

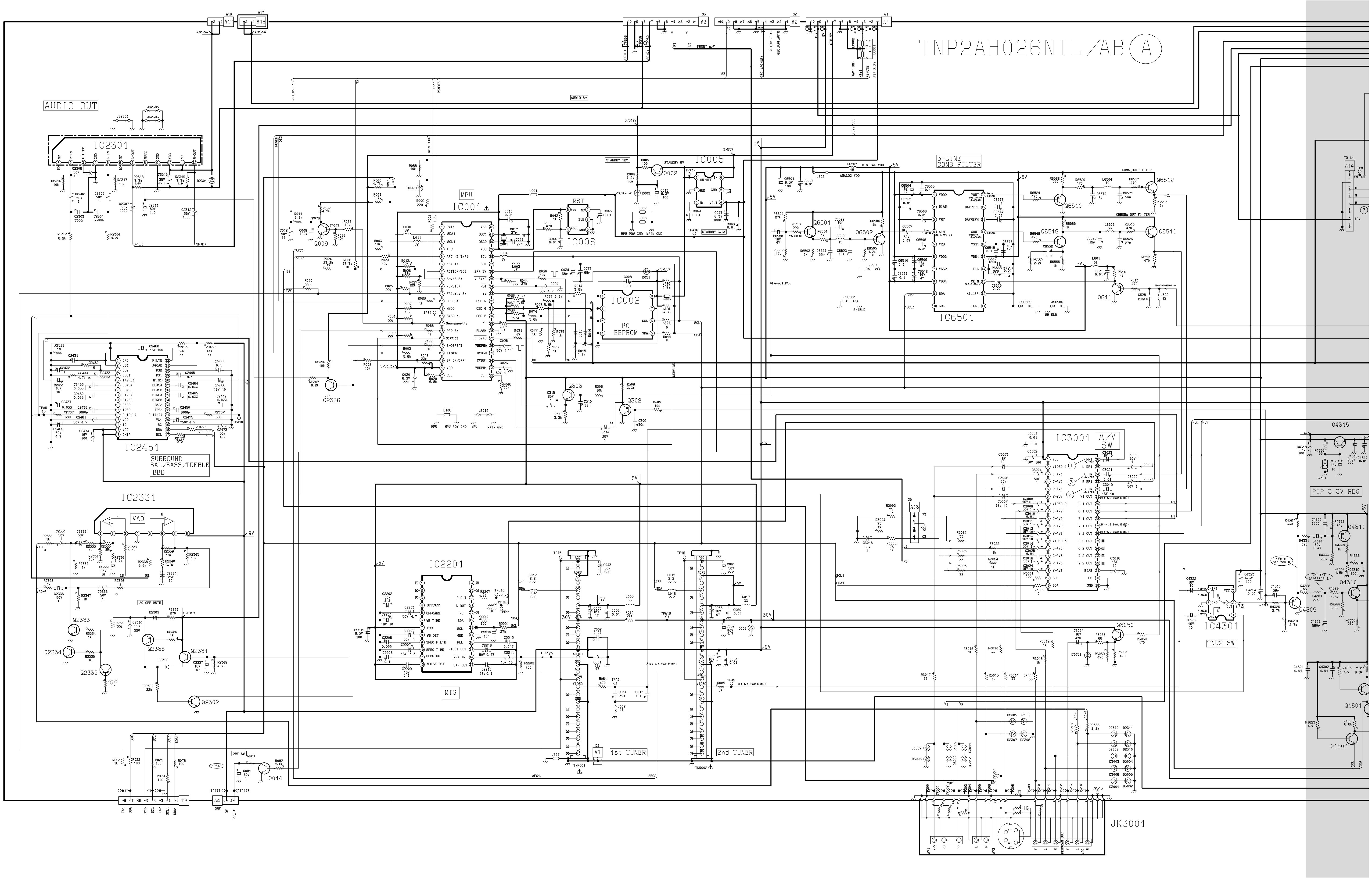
NOTE: All other component symbols are used for engineering design purposes.

Notas de los Diagramas

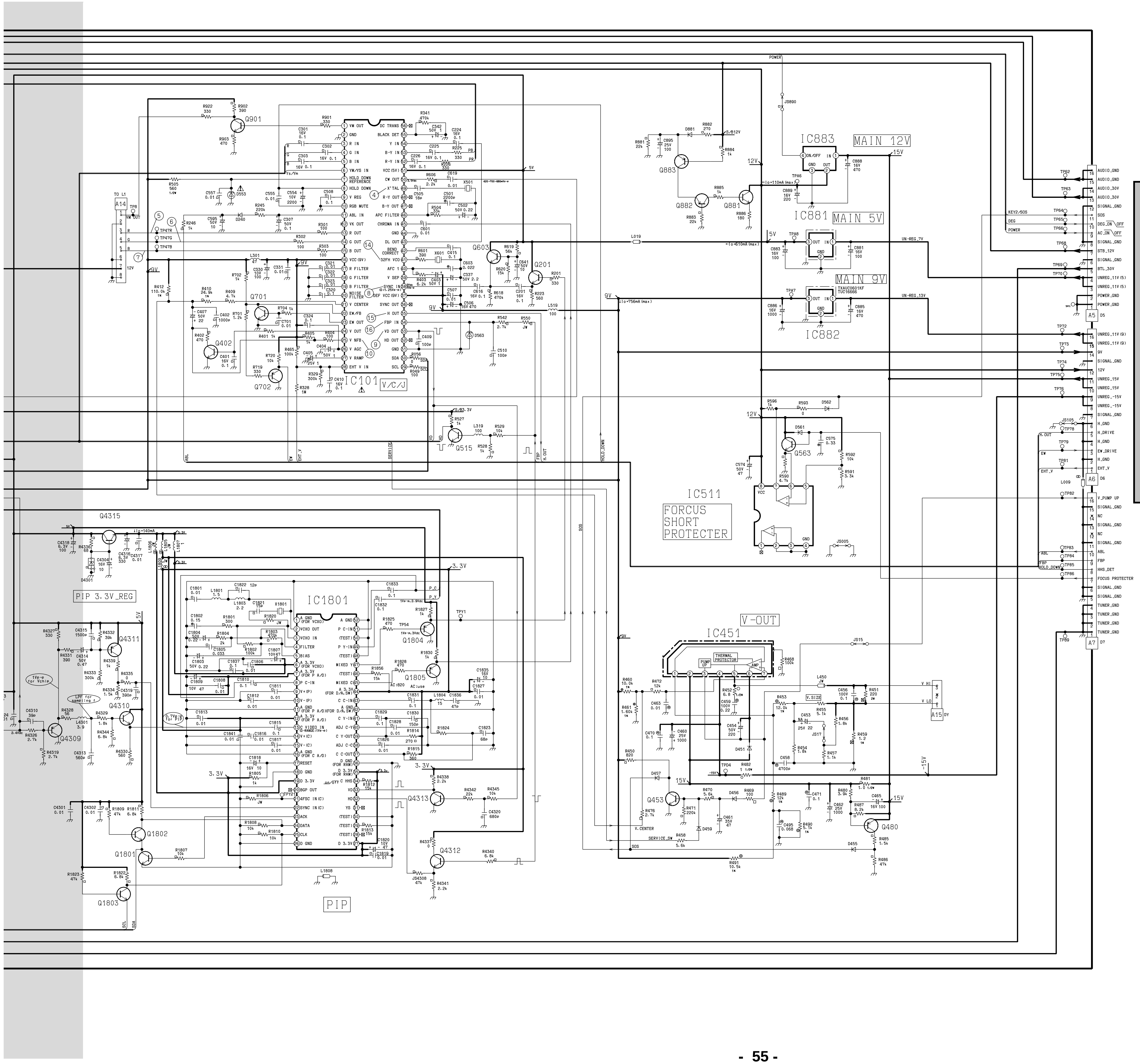
1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ♀ Los puntos de prueba fuera de los componentes se indican con ♀.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

***NOTA:** Los demas símbolos de componentes incluidos son usados con fines de diseño.*

A-Board Schematic, Left Portion - Diagrama Eléctrico de la Tarjeta-A, Sección Izquierda


TNP2AH026NIL/AB Ⓐ
AUDIO OUT
IC2301
IC2451
SURROUND BAL/BASS/TREBLE BBE
IC2331
VAO
AC OFF MUTE
MPU
IC001
RST
IC006
IC005
IC002
I²C EEPROM
STANDBY 12V
STANDBY 5V
STANDBY 3.3V
AUDIO B+
FRONT A/V
3-LINE COMB FILTER
IC6501
LUMA OUT FILTER
CHROMA OUT FILTER
DIGITAL VDD
ANALOG VDD
IC3001 A/V SW
IC2201
MTS
1st TUNER
2nd TUNER
TNR001
TNR002
IC4301
TNR2 SW
PIP 3.3V_REG
JK3001
Q002
Q009
Q2336
Q303
Q302
Q2333
Q2334
Q2332
Q2335
Q2331
Q2302
Q014
Q6501
Q6502
Q6510
Q6512
Q6519
Q6511
Q611
Q3050
Q4315
Q4311
Q4310
Q4309
Q1801
Q1803
A1
A2
A3
A4
A8
A13
A14
A16
A17
TP

A-Board Schematic, Right Portion - Diagrama Eléctrico de la Tarjeta-A, Sección Derecha


IC883 MAIN 12V
IC881 MAIN 5V
IC882 MAIN 9V
IC101 V/C/J
IC511
FORCUS SHORT PROTECTER
IC451 V-OUT
IC1801
PIP
PIP 3.3V_REG
Q901
Q603
Q201
Q701
Q402
Q702
Q515
Q883
Q882
Q881
Q563
Q4315
Q4311
Q4310
Q4309
Q1804
Q1805
Q4313
Q4312
Q1802
Q1801
Q1803
Q453
Q480
A14
A5
A6
A7
A15
POWER
12V
15V
9V
5V
3.3V
AUDIO_GND
AUDIO_30V
SIGNAL_GND
SOS
DEG_ON OFF
AC_ON OFF
STB_12V
BTL_30V
UNREG_11V(5)
POWER_GND
UNREG_15V(9)
UNREG_15V
UNREG_-15V
H_GND
H_DRIVE
EW_DRIVE
EHT_V
V_PUMP UP
ABL
FBP
RHS_DET
FOCUS PROTECTER
TUNER_GND

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A IN THE SCHEMATIC.

Medición de Voltajes

1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

Voltage Measurements

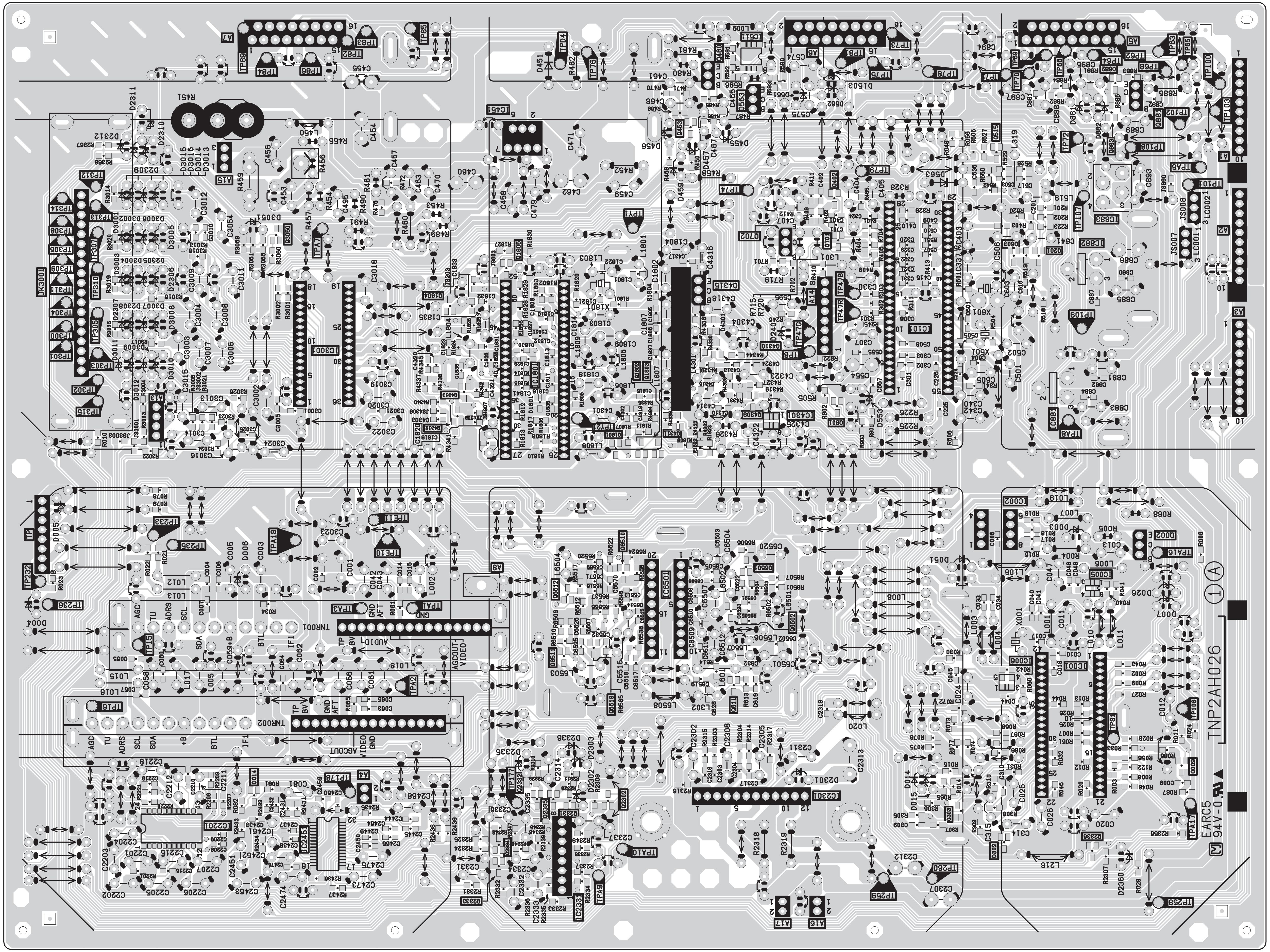
1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

*CAUTION: **Incorrect ground connection of the test equipment will result in erroneous readings.***

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

A-Board Layout - Diagrama Impreso de la Tarjeta-A


TNP2AH026
1A
EARC5
94V-0
TNR001
TNR002
AGC
TU
ADRS
SCL
SDA
+B
BTL
IF1
AGCOUT
VIDEO
GND
AUDIO
AFT

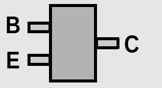
IC001			
1	0.00	22	2.10
2	4.70	23	2.40
3	4.70	24	1.40
4	1.70	25	1.40
5	1.40	26	2.40
6	3.30	27	2.90
7	1.50	28	0.00
8	3.30	29	.10
9	2.80	30	.10
10	1.70	31	.10
11	0.00	32	.10
12	3.30	33	.10
13	1.70	34	3.30
14	.10	35	2.90
15	3.20	36	3.10
16	3.20	37	3.30
17	.10	38	3.30
18	3.20	39	3.30
19	1.20	40	1.60
20	3.30	41	1.60
21	1.50	42	0.00

IC002	
1	0.00
2	0.00
3	0.00
4	0.00
5	3.20
6	3.20
7	0.00
8	4.80

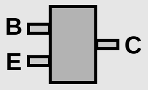
IC005	
1	4.80
2	0.00
3	1.30
4	3.30
5	0.00
6	4.80

IC006	
1	0.00
2	0.00
3	0.00
4	3.30
5	3.30

CHIP TRANSISTOR LEAD DESIGNATION



IDENTIFICACIÓN DE TERMINALE PARA TRANSISTORES EN *CHIP*



IC101			
1	4.10	29	3.30
2	0.00	30	3.30
3	3.30	31	0.00
4	3.30	32	0.10
5	3.30	33	0.00
6	0.00	34	0.70
7	6.10	35	1.90
8	4.90	36	-0.20
9	5.20	37	8.80
10	0.00	38	3.00
11	5.50	39	6.10
12	4.60	40	7.30
13	2.60	41	5.80
14	2.50	42	4.90
15	2.60	43	1.00
16	8.60	44	0.00
17	5.10	45	1.80
18	5.10	46	1.40
19	5.20	47	2.30
20	2.60	48	2.30
21	1.90	49	3.90
22	3.90	50	3.40
23	0.70	51	4.90
24	0.70	52	3.00
25	5.20	53	3.00
26	2.00	54	3.70
27	4.30	55	3.00
28	5.40	56	3.20

IC1801			
1	0.00	27	3.50
2	1.50	28	3.50
3	1.70	29	0.00
4	1.70	30	0.00
5	1.70	31	0.00
6	3.50	32	0.60
7	3.50	33	0.20
8	1.10	34	3.50
9	1.60	35	3.50
10	.50	36	0.00
11	0.00	37	3.00
12	3.50	38	1.30
13	0.80	39	3.10
14	1.60	40	1.40
15	0.50	41	1.10
16	0.00	42	0.00
17	3.50	43	1.10
18	0.0	44	3.50
19	3.50	45	1.10
20	0.00	46	3.50
21	0.00	47	1.10
22	0.20	48	0.00
23	0.10	49	1.00
24	2.50	50	0.00
25	2.50	51	1.10
26	0.00	52	0.00

IC2201	
1	0.00
2	0.00
3	0.00
4	2.30
5	2.40
6	0.70
7	4.90
8	0.00
9	2.70
10	0.80
11	2.20
12	2.40
13	2.90
14	2.20
15	3.00
16	3.40
17	0.00
18	3.20
19	3.30
20	0.00
21	2.20
22	2.20
23	0.00
24	0.00

IC2301	
1	0.00
2	0.00
3	30.60
4	0.00
5	0.00
6	0.00
7	0.00
8	.70
9	0.00
10	31.90
11	31.90
12	15.30

IC2331	
1	4.40
2	4.40
3	4.40
4	4.40
5	0.00
6	4.40
7	4.40
8	8.80

IC2451			
1	0.00	17	4.70
2	1.30	18	4.70
3	1.30	19	2.00
4	4.40	20	.10
5	4.40	21	4.40
6	4.40	22	4.40
7	4.40	23	4.40
8	4.40	24	4.40
9	4.40	25	0.00
10	4.40	26	4.40
11	4.40	27	4.40
12	4.40	28	4.40
13	.10	29	4.40
14	1.60	30	4.40
15	8.80	31	3.40
16	8.80	32	4.40

IC3001			
1	8.80	19	0.00
2	3.50	20	0.00
3	4.60	21	4.10
4	4.60	22	3.20
5	4.60	23	3.90
6	3.50	24	3.90
7	3.50	25	3.90
8	4.60	26	0.00
9	4.60	27	3.20
10	4.60	28	3.90
11	3.60	29	0.00
12	3.60	30	3.90
13	4.60	31	3.50
14	4.60	32	3.80
15	4.60	33	4.60
16	3.60	34	4.60
17	4.70	35	4.60
18	4.60	36	3.80

IC4301	
1	4.90
2	2.00
3	3.10
4	1.80
5	0.00
6	1.90

IC511	
1	0.10
2	0.00
3	0.00
4	0.00
5	2.90
6	7.40
7	0.40
8	11.90

IC451	
1	1.30
2	14.50
3	-12.60
4	-14.60
5	0.00
6	14.50
7	1.40

IC6501	
1	4.90
2	1.40
3	3.10
4	2.30
5	1.80
6	4.90
7	0.00
8	4.90
9	4.70
10	4.70
11	0.00
12	0.00
13	2.50
14	2.00
15	4.90
16	0.00
17	2.50
18	3.10
19	1.80
20	2.30

IC881	
1	8.60
2	0.00
3	4.90

IC882	
1	13.00
2	0.00
3	8.90

IC883	
1	14.80
2	11.90
3	0.00
4	2.10

	Q002	Q009	Q014	Q1801	Q1802
B	5.60	0.20	0.80	0.00	3.10
C	5.20	3.50	0.10	3.30	2.50
E	4.80	0.00	0.00	0.00	3.30

	Q1803	Q1804	Q1805	Q201	Q2331
B	3.10	1.00	1.10	1.60	0.10
C	2.60	0.00	0.00	4.90	11.10
E	3.20	0.60	1.70	1.00	0.00

	Q2332	Q2333	Q2334	Q2335	Q2336
B	0.00	0.00	0.00	11.20	0.60
C	0.00	0.00	0.00	0.00	0.00
E	0.00	0.00	0.00	10.50	0.00

	Q303	Q3050	Q402	Q4309	Q4310
B	3.50	3.50	0.60	1.10	1.40
C	4.90	8.90	3.60	0.00	4.90
E	2.80	2.80	0.00	1.80	0.80

	Q4311	Q4312	Q4313	Q4315	Q453
B	4.60	0.30	0.60	4.20	0.70
C	0.40	3.50	0.10	4.90	0.00
E	4.90	0.60	0.00	3.50	0.00

	Q480	Q515	Q563	Q6501	Q6502
B	14.60	0.10	7.90	3.00	1.30
C	0.00	2.90	11.90	4.90	0.00
E	14.80	0.00	7.40	2.30	2.00

	Q6510	Q6511	Q6512	Q6519	Q701
B	2.30	3.10	2.90	2.50	0.60
C	0.00	4.90	4.90	3.10	3.90
E	2.90	2.40	2.30	1.80	0.00

	Q702	Q901
B	3.80	4.10
C	0.00	6.10
E	4.40	3.40

Voltage Measurements

1. Voltage measurement:
   - AC input to the Receiver is 120V. NTSC (HD, 1125i & 525P when applicable) signal generator is connected to the antenna of the Receiver. (Color bar pattern of 100 IRE white and 7.5 IRE black.)
   - All Picture and Audio adjustments are set to Normalize.
     TV ANT/CABLE - (Set-Up Menu) in TV/ANT Mode
     Volume - Min.
     TV/Video SW - TV position
     Audio Mode - Stereo
   - Voltage readings are nominal and may vary ±10% on active devices. Some voltage reading will vary with signal strength and picture content.
   - Supply voltages are nominal.
2. Ground symbol ⏚ indicates ground lead connection of meter. Incorrect ground connection will result in erroneous readings.

CAUTION: ***Incorrect ground connection of the test equipment will result in erroneous readings.***

Medición de Voltajes

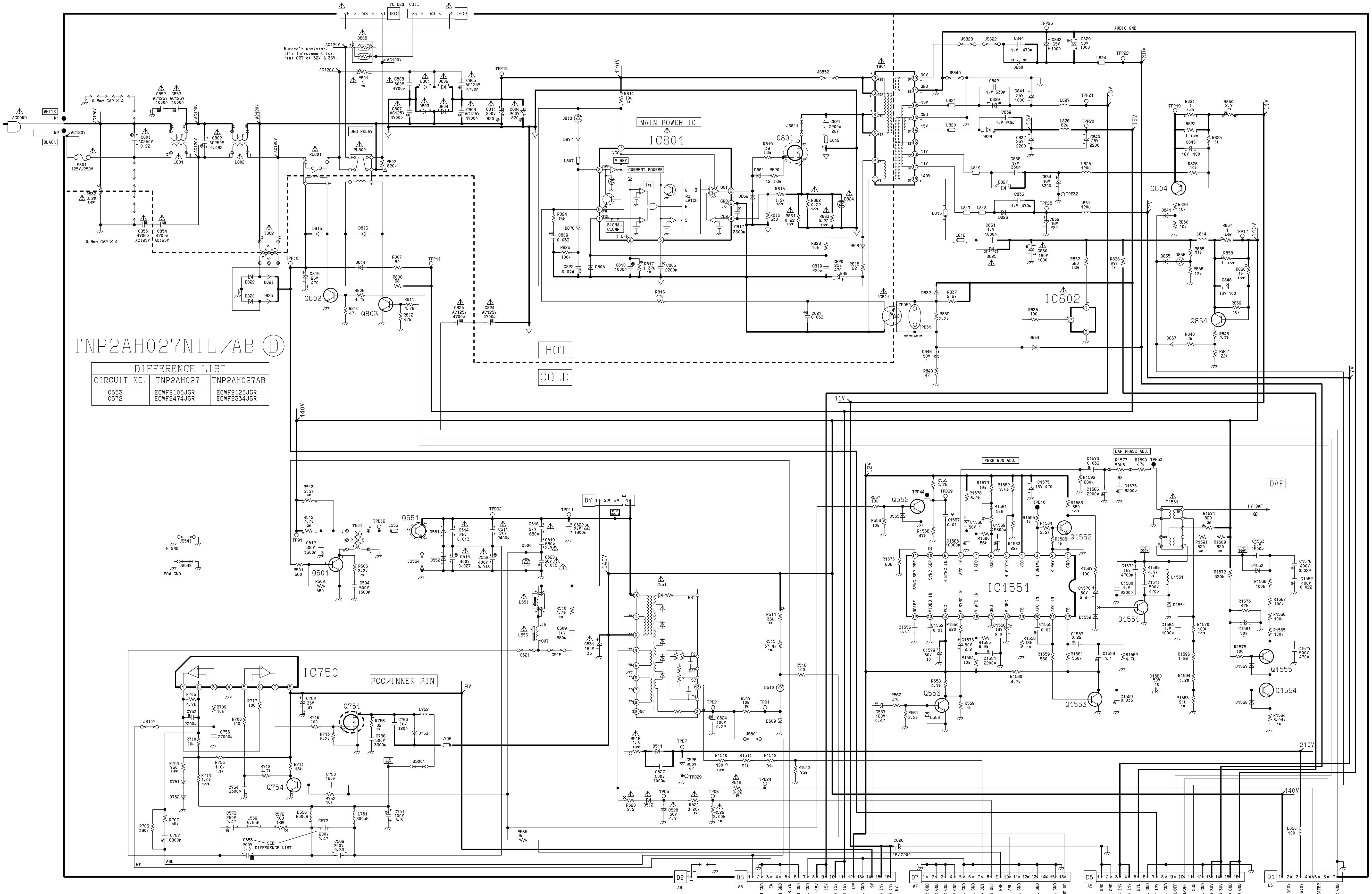
1. Medición de voltaje:
   - El voltaje de entrada al Receptor es de 120V de Corriente Alterna. Un generador de patrones con formato NTSC se conecta a la entrada de la antena. (Patrón de Barras de Colores con 100 IREs para el Blanco y 7.5 IREs para el Negro.)
   - Los ajustes de los Menus Picture y Audio se normalizan.
     En el Menú Set-Up, en la opción ANTENA, se selecciona el modo de CABLE.
     El nivel de Volumen se minimiza.
     De los modos TV y Video, seleccionar el modo TV.
     Seleccionar modo Estereo del Audio.
   - Las mediciones de los voltajes son nominales y pueden variar hasta 10% en componentes en funcionamiento. Las lecturas de los voltajes pueden variar por la potencia de la señal y el contenido de la imagen.
   - Las fuentes de voltajes son nominales.
2. El símbolo indica el tipo de tierra que se utiliza en la conexión del medidor.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

Note:
Obtained voltages with a digital multimeter.

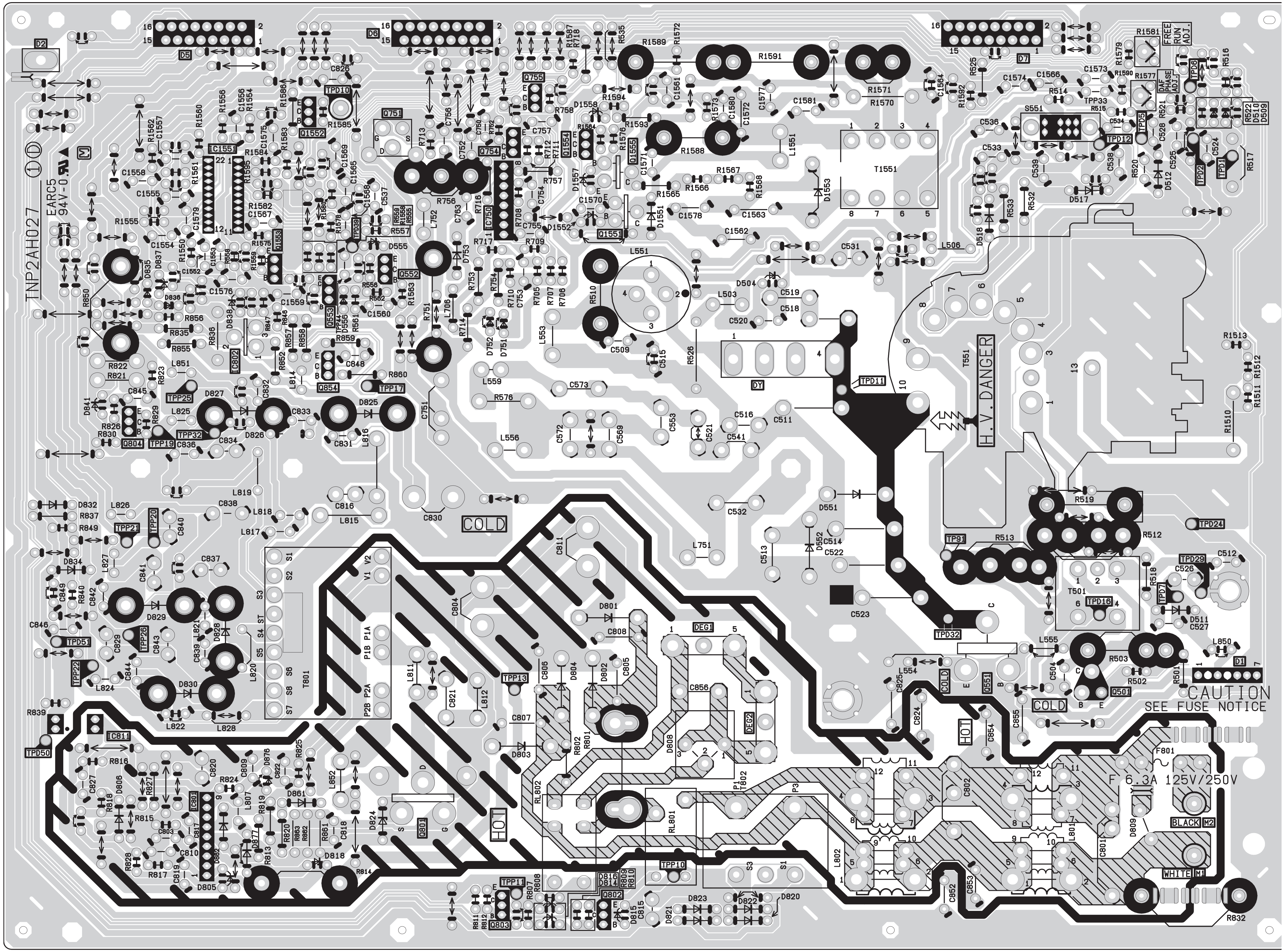
Nota:
La medición de los voltajes se hizo con un Voltímetro Digital .

D-Board Schematic - Diagrama Eléctrico Tarjeta-D


TO DEG. COIL
DEG1
DEG2
Murata's posistor.
It's improvement for
flat CRT of 32V & 36V.
ACCORD
WHITE
BLACK
F801 125V/250V
0.8mm GAP × 4
DEG RELAY
MAIN POWER IC
IC801
CURRENT SOURSE
SIGNAL CLUMP
RS LATCH
Q801
IC802
Q802
Q803
Q804
Q854
T801
T802
HOT
COLD
TNP2AH027NIL/AB Ⓓ
DIFFERENCE LIST
CIRCUIT NO. | TNP2AH027 | TNP2AH027AB
C553 | ECWF2105JSR | ECWF2125JSR
C572 | ECWF2474JSR | ECWF2334JSR
AUDIO GND
30V
15V
11V
140V
Q501
Q551
T501
T551
DY
IC750
PCC/INNER PIN
Q751
Q754
SEE DIFFERENCE LIST
FREE RUN ADJ.
DAF PHASE ADJ.
DAF
IC1551
Q552
Q553
Q1551
Q1552
Q1553
Q1554
Q1555
T1551
HV DAF
210V
D2 A8
D6 A6
H GND
EW
H GND
H DRIVE
H GND
SIGNAL GND
UNREG -15V
UNREG -15V
UNREG 15V
UNREG 15V
12V
SIGNAL GND
9V
UNREG 11V
UNREG 11V for 9V
D7 A7
TUNER GND
TUNER GND
TUNER GND
TUNER GND
SIGNAL GND
SIGNAL GND
FOCUS DET
HHS DET
FBP
ABL
SIGNAL GND
SIGNAL GND
SIGNAL GND
V PUMP UP
D5 A5
POW GND
POW GND
UNREG 11V
UNREG 11V
BTL
SIGNAL GND
STBY 12V
SIGNAL GND
AC ON/OFF
DEG ON/OFF
SOS
SIGNAL GND
AUDIO 30V
AUDIO 30V
AUDIO GND
AUDIO GND
D1 L3
140V
210V
HEATER
HETER GND

D-Board Layout & Voltages - Circuito Impreso y Voltajes Tarjeta-D

ALL MODELS


TNP2AH027
1D
EARC5
94V-0
COLD
HOT
H.V. DANGER
CAUTION
SEE FUSE NOTICE
F 6.3A 125V/250V
BLACK M2
WHITE M1
T551
T1551
T501
T801
DY
DEG1
DEG2
F801
R832

	Q1551	Q1552	Q1554
B	0.10	0.10	4.40
C	95.70	1.20	16.00
E	0.00	0.00	3.80

	Q1555	Q501	Q551
B	16.50	0.40	0.10
C	123.90	93.20	14.60
E	16.30	0.00	0.00

	Q552	Q553	Q751
B	-0.10	0.00	0.00
C	8.20	2.00	21.80
E	0.00	0.00	7.00

	Q754	Q801	Q802
B	-0.30	0.00	0.70
C	4.60	0.60	0.20
E	0.00	0.00	0.00

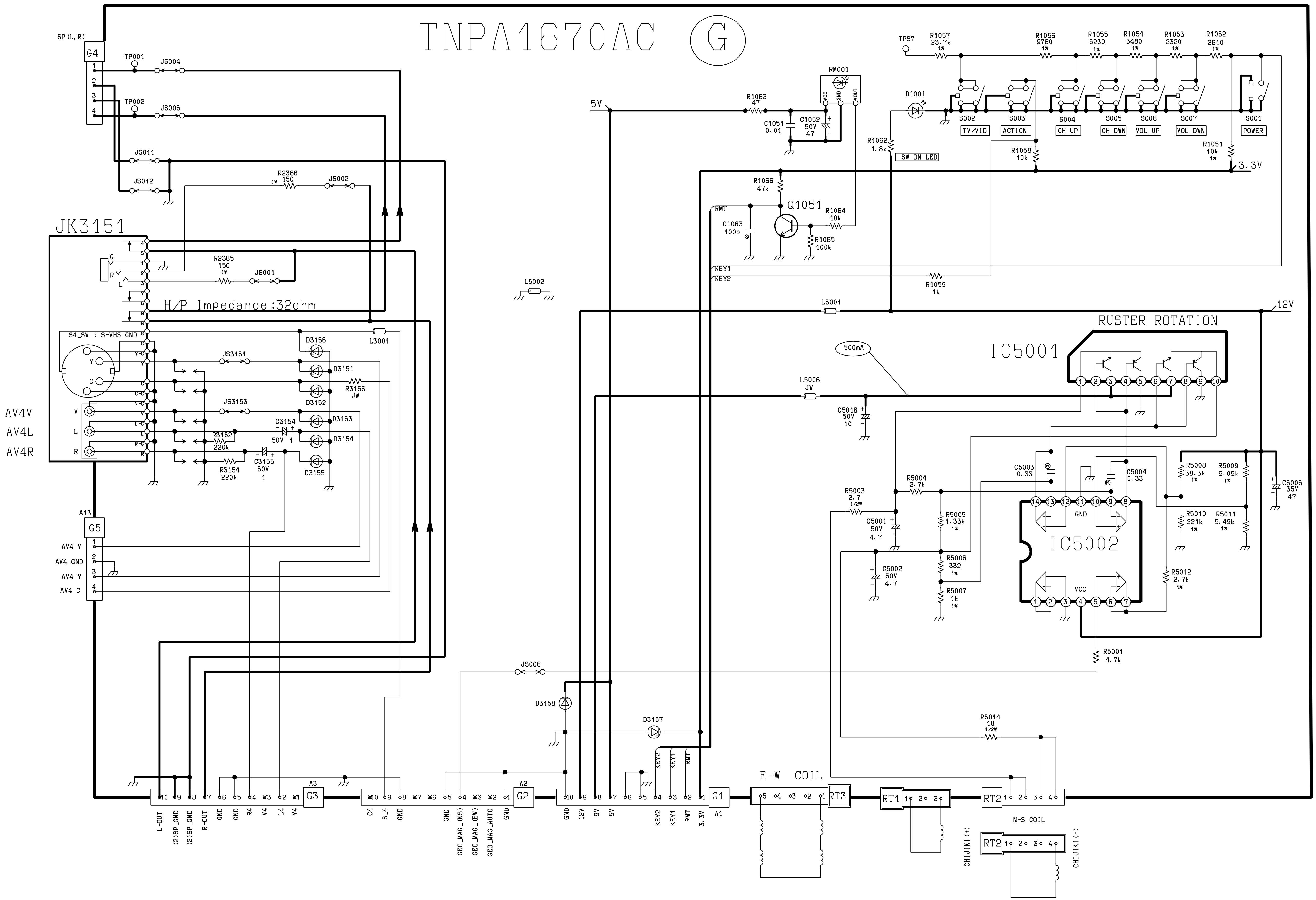
	Q803	Q854
B	0.00	139.50
C	14.80	0.00
E	0.00	139.80

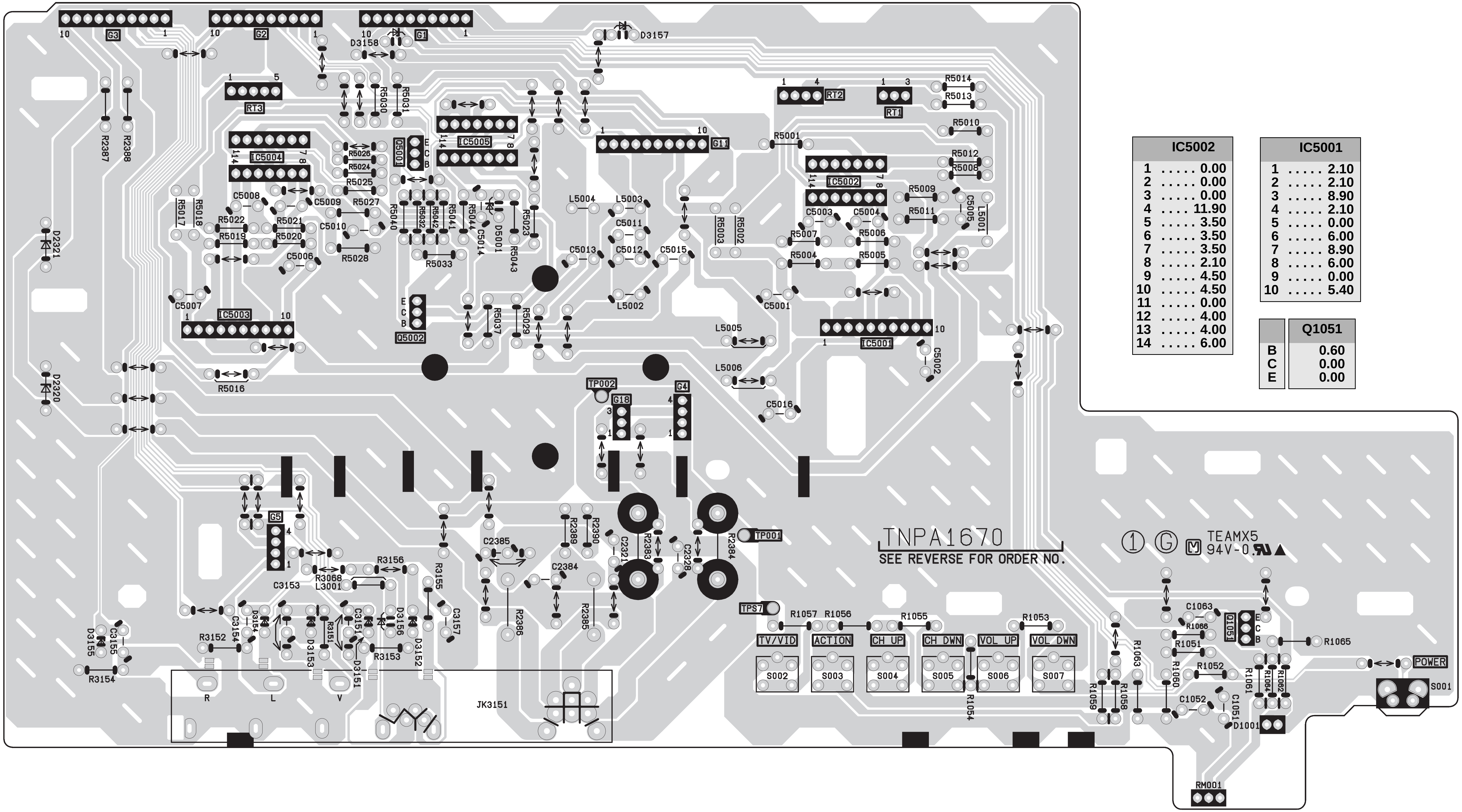
IC1551	
1	0.00
2	0.00
3	2.80
4	11.90
5	6.90
6	6.00
7	5.40
8	2.80
9	10.70
10	11.90
11	7.10
12	7.10
13	3.60
14	11.90
15	11.50
16	5.50
17	7.50
18	3.90
19	4.60
20	0.60
21	4.60

IC750	
1	2.10
2	4.40
3	4.40
4	0.00
5	4.60
6	2.10
7	7.10
8	8.90

IC801	
1	1.46
2	0.37
3	0.17
4	0.00
5	0.00
6	5.10
7	15.21
8	0.00
9	5.92

IC802	
1	138.90
2	11.80
3	0.10


TNPA1670AC
G
SP(L,R)
G4
TP001
JS004
TP002
JS005
JS011
JS012
R2386 150 1W
JS002
JK3151
R2385 150 1W
JS001
H/P Impedance:32ohm
S4_SW : S-VHS GND
Y
C
V
L
R
AV4V
AV4L
AV4R
JS3151
JS3153
D3156
D3151
D3152
D3153
D3154
D3155
L3001
R3156 JW
C3154 50V 1
R3152 220k
R3154 220k
C3155 50V 1
A13
G5
AV4 V
AV4 GND
AV4 Y
AV4 C
L5002
5V
R1063 47
C1051 0.01
C1052 50V 47
RM001
VCC
GND
VOUT
D1001
R1062 1.8k
SW ON LED
R1066 47k
RMT
C1063 100p
Q1051
R1064 10k
R1065 100k
KEY1
KEY2
R1059 1k
TPS7
R1057 23.7k 1%
R1056 9760 1%
R1055 5230 1%
R1054 3480 1%
R1053 2320 1%
R1052 2610 1%
S002 TV/VID
S003 ACTION
S004 CH UP
S005 CH DWN
S006 VOL UP
S007 VOL DWN
S001 POWER
R1058 10k
R1051 10k 1%
3.3V
L5001
12V
RUSTER ROTATION
500mA
IC5001
L5006 JW
C5016 50V 10
C5003 0.33
C5004 0.33
R5004 2.7k
R5003 2.7 1/2W
C5001 50V 4.7
R5005 1.33k 1%
R5006 332 1%
R5007 1k 1%
C5002 50V 4.7
R5008 38.3k 1%
R5009 9.09k 1%
R5010 221k 1%
R5011 5.49k 1%
C5005 35V 47
R5012 2.7k 1%
IC5002
GND
VCC
R5001 4.7k
JS006
D3158
D3157
R5014 18 1/2W
KEY2
KEY1
RMT
E-W COIL
G3
A3
G2
A2
G1
A1
RT3
RT1
RT2
N-S COIL
CHIJIKI(+)
CHIJIKI(-)
L-OUT
(2)SP_GND
(2)SP_GND
R-OUT
GND
GND
R4
V4
L4
Y4
C4
S_4
GND
GND
GEO_MAG_(NS)
GEO_MAG_(EW)
GEO_MAG_AUTO
GND
GND
12V
9V
5V
KEY2
KEY1
RMT
3.3V


G3
G2
G1
D3158
D3157
RT3
RT2
RT1
R5030
R5031
R2387
R2388
IC5004
IC5005
IC5002
IC5003
IC5001
G11
Q5001
Q5002
R5026
R5024
R5025
R5027
R5028
R5017
R5018
R5022
R5019
R5021
R5020
C5008
C5009
C5010
C5006
C5007
R5040
R5032
R5042
R5041
R5044
C5014
D5001
R5023
R5043
R5033
R5037
R5029
L5004
L5003
C5011
C5012
C5013
C5015
L5002
R5003
R5002
R5001
R5014
R5013
R5010
R5012
R5008
R5009
R5011
C5005
L5001
C5003
C5004
R5007
R5006
R5004
R5005
C5001
C5002
L5005
L5006
C5016
R5016
D2321
D2320
TP002
G18
G4
G5
TP001
TPS7
C2385
C2384
R2389
R2390
C2321
R2383
C2328
R2384
R2386
R2385
R3156
R3155
R3068
L3001
C3153
C3154
C3157
D3154
D3153
R3151
C3151
D3156
D3152
D3151
R3152
R3153
R3154
D3155
C3155
JK3151
R
L
V
TNPA1670
SEE REVERSE FOR ORDER NO.
TEAMX5
94V-0
R1057
R1056
R1055
R1053
TV/VID
ACTION
CH UP
CH DWN
VOL UP
VOL DWN
S002
S003
S004
S005
S006
S007
R1054
R1059
R1058
R1063
R1060
C1063
R1066
R1051
R1052
R1061
R1064
R1062
C1052
C1051
D1001
Q1051
R1065
POWER
S001
RM001

IC5002	
1	..... 0.00
2	..... 0.00
3	..... 0.00
4	.... 11.90
5	..... 3.50
6	..... 3.50
7	..... 3.50
8	..... 2.10
9	..... 4.50
10	..... 4.50
11	..... 0.00
12	..... 4.00
13	..... 4.00
14	..... 6.00

IC5001	
1	..... 2.10
2	..... 2.10
3	..... 8.90
4	..... 2.10
5	..... 0.00
6	..... 6.00
7	..... 8.90
8	..... 6.00
9	..... 0.00
10	..... 5.40

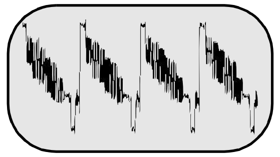
	Q1051
B	0.60
C	0.00
E	0.00

Note:

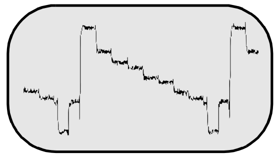
Obtained voltages with a digital multimeter.

Nota:

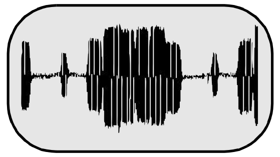
La medición de los voltajes se hizo con un Voltímetro Digital.



① **1.00V p-p**
IC3001 PIN 36
(Main Video)

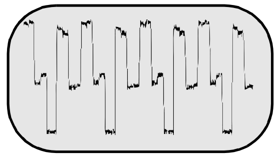


② **1.11V p-p**
IC3001 PIN 32
Y_IN

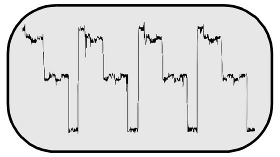


③ **5.36V p-p**
IC3001 PIN 34
C_IN

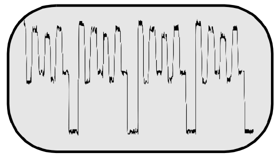
④ X'TAL
IC101 PIN 49



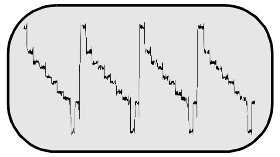
⑤ **3.48V p-p**
IC101 PIN 13
(R_OUT)



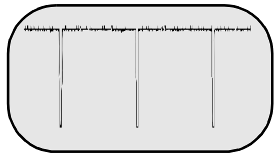
⑥ **3.44V p-p**
IC101 PIN 14
(G_OUT)



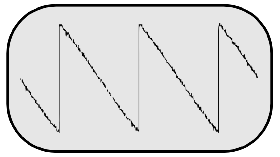
⑦ **3.40V p-p**
IC101 PIN 15
(B_BLUE)



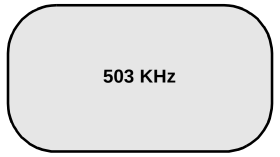
⑧ **1.06V p-p**
IC101 PIN 38
(MIXED_C)



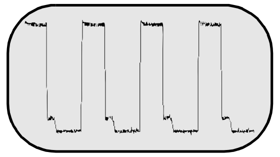
⑨ **4.24V p-p**
IC101 PIN 33
(VD_OUT)



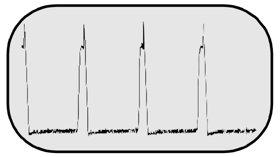
⑩ **1.56V p-p**
IC101 PIN 25
(V_NFB)



⑭ X'TAL
IC101 PIN 41



⑮ **2.64V p-p**
IC101 PIN 35
(H_OUT)



⑯ **7.84V p-p**
IC101 PIN 34
(FBP_IN)

NOTA DE SEGURIDAD

LOS DIAGRAMAS ELÉCTRICOS INCLUYEN CARACTERÍSTICAS ESPECIALES MUY IMPORTANTES PARA LA PROTECCIÓN CONTRA RAYOS-X, QUEMADURAS Y DESCARGAS ELÉCTRICAS. CUANDO SE DE SERVICIO ES IMPORTANTE USAR PARA REEMPLAZO DE COMPONENTES CRITICOS, SOLO PARTES ESPECIFICADAS POR EL FABRICANTES. LOS COMPONENTES CRITICOS ESTAN SEÑALADOS EN LOS DIAGRAMAS POR EL SIMBOLO ⚠.

IMPORTANT SAFETY NOTICE

THIS SCHEMATIC DIAGRAM INCORPORATES SPECIAL FEATURES THAT ARE IMPORTANT FOR PROTECTION FROM X-RADIATION, FIRE AND ELECTRICAL SHOCK HAZARDS. WHEN SERVICING IT IS ESSENTIAL THAT ONLY MANUFACTURERS SPECIFIED PARTS BE USED FOR THE CRITICAL COMPONENTS DESIGNATED WITH A ⚠ IN THE SCHEMATIC.

Schematic Notes

1. Resistors are carbon 1/4W unless noted otherwise.
2. Capacitors are ceramic 50V unless noted otherwise.
3. Coil value notes is inductance in µH.
4. Test point indicated by ●, Test point but no pin ○.
5. Components indicated with ⚠ are critical parts and replacement should be made with manufacture specified replacement parts only.
6. ▬ (**BOLD LINE**) indicates the route of B+ supply.
7. The schematic diagrams are current at the time of printing and are subject to change without notice.
8. Ground symbol ⏚ indicates **HOT GROUND CONNECTION**; ⏚ indicates COLD GROUND.

Note: All other component symbols are used for engineering design purposes.

Medición de Formas de Onda

1. Un símbolo como indica el punto para medir una señal. (La medición puede hacerse en el punto con mayor accesibilidad, siempre que sea común al indicado.)
2. Se midieron utilizando un generador con formato NTSC conectado a la terminal de la antena. (Patrón de 8 Barras de Colores EAI, formato NTSC de 100 IREs para el Blanco y 7.5 IREs para el Negro.)
3. Los ajustes de usuario de los Menus PICTURE y AUDIO se normalizaron. Posteriormente el nivel de volumen se ajusta al mínimo.
4. Las formas de onda de Video y Color fueron tomadas con un osciloscopio de banda alta y con un punta de prueba de baja capacitancia (10 a 1). La forma y amplitud de las ondas puede variar según el tipo de osciloscopio que se utilice y sus características.
5. El símbolo de tierra ⏚ que aparece junto al número de la forma de onda, indica que se utiliza conexión a **Tierra Caliente** en el extremo negativo de la punta de prueba.

PRECAUCION: Si no se utiliza la conexión a la tierra adecuada, se obtendrán mediciones equivocadas y podría dañar el equipo de medición.

Waveform Measurements

1. ③ indicates waveform measurement. (Measurement can be taken at the best accessible location in common to the indicated point.)
2. Taken with an NTSC signal generator connected to the antenna terminal. (NTSC color bar pattern of 8 bars of EIA colors, 100 IRE white and 7.5 IRE black.)
3. Customer Controls (Picture/Audio Menu) are set to Normalize. Volume is set to "MIN".
4. All video and color waveforms are taken with a wideband scope and a probe with low capacitance (10 to 1). Shape and peak altitudes may vary depending on the type of Oscilloscope used and its settings.
5. Ground symbol ⏚ shown on waveform number indicates (Hot) ground lead connection of the Oscilloscope.

CAUTION: Incorrect ground connection of the test equipment will result in erroneous readings.

Notas de los Diagramas

1. Las Resistencias son de Carbón de 1/4W, a menos que se indique otra característica.
2. Los Capacitores son de Cerámica para 50V, a menos que se indique otra característica.
3. El valor indicado de las Bobinas es la inductancia expresada en µH.
4. Los puntos de prueba en la terminal de algún componente son indicados por ● Los puntos de prueba fuera de los componentes se indican con ○.
5. Los componentes señalados con el símbolo ⚠ son considerados componentes críticos y deben ser reemplazados sólo con las partes especificadas por el fabricante.
6. ▬ (**LINEA GRUESA**) indica las líneas de alimentación de los Voltajes B+.
7. Los diagramas eléctricos están sujetos a cambio sin previo aviso.
8. El símbolo ⏚ indica que es una conexión a **Tierra Caliente** y el símbolo ⏚ indica conexión a **Tierra Fría**.

NOTA: ***Los demas símbolos de componentes incluidos son usados con fines de diseño.***

PARTS LIST ABBREVIATIONS GUIDE

RESISTOR			
TYPE		TOLERANCE	
C	Carbon	F	± 1%
F	Fuse	J	± 5%
M	Metal Oxide	K	± 10%
S	Solid	M	± 20%
W	Wire Wound	G	± 2%

RES, C 270-J-1/4

CAPACITOR			
TYPE		TOLERANCE	
C	Ceramic	C	± 0.25pF
E	Electrolytic	D	± 0.5pF
P	Polyester	F	± 1pF
S	Styrol	J	± 5%
T	Tantalum	K	± 10%
		L	± 15%
		M	± 20%
		P	+10% -0%
		Z	+80% -20%

CAP, P .068UF-K-50V

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